CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1903,

BY

JAMES NIVEN, M.A., M.B.

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SOCIETY

PUBLIC HEALTH OFFICE,

TOWN HALL, MANCHESTER,

JULY 23RD, 1904.

MY LORD MAYOR, ALDERMEN, AND MEMBERS
OF THE CITY COUNCIL.

I beg to present to you my Annual Report on the Health of the City of Manchester for the year 1903.

The death-rate is the lowest yet reached. Yet the relative position of Manchester amongst great towns is not altered.

Amongst causes of death, Phthisis may be selected as one in which the death-rate for the year is considerably below that in any previous year. The ages at which the death-rate is conspicuously low, may be described as those making up early adult life.

The proportion of deaths occurring in public institutions has again increased. A review of the mortality for the last 50 years shows a marked advance in childhood, adolescence, and early adult life. There is little or no improvement manifest in infancy, and actual recession is shown in advanced life.

The gradually increasing aggregation of the population in towns tends to lower the national physique. Hitherto, it is believed, there have been factors at work which have more than balanced the tendency to deterioration.

While sanitary administration has effected much, it is believed that cheap food, clothing, and fuel have been the chief agents in the improvement manifest.

If the advance already made in our large towns is to be maintained, it is believed that poor children must be better trained—physically and mentally. This will involve machinery by which we may ensure that school children are adequately fed.

But it will also involve the practical instruction of teachers in a carefully devised scheme of hygiene, and of the older boys and girls in the elementary principles of health.

The older girls must be taught to cook ; to choose foods economically ; to manage infants and young children.

Further, new means must be devised for securing wholesome and fresh food for infants and young children.

During the year 1903 a considerable incidence of Smallpox occurred. The history of the outbreak is given by Dr. Cowie very fully and clearly. It was held in check by attention to individual cases, by the night inspections in lodging-houses, and by a vigorous and sustained effort to secure re-vaccination, especially in common lodging-houses. All patients were oiled during the acute stage, and no spread from the hospital occurred. We may fairly claim to have successfully met the difficulties presented.

Much attention was given by Alderman McDougall to the condition of Clayton Hospital, which has been rendered much more useful by the inclusion of outlying buildings, by improved fittings, and by a suitable enclosure.

A Bill for the obligatory re-vaccination of children at the age of 12 was presented to Parliament during the past Session, of which the Council of this City expressed their approval.

In my opinion, if Smallpox is to be kept within reasonable limits in this country, such a measure is necessary. The disease shows every sign of extending, and the experience of Germany has clearly proved that it can be prevented from becoming epidemic here and there by obligatory re-vaccination. Our own experience seems to show that, without obligatory re-vaccination, we cannot hope to prevent the occurrence of outbreaks.

A section is devoted to the consideration of Scarlet Fever. Your Medical Officer of Health has arrived at the conclusion that Scarlet Fever Wards are a necessary security to the City, though it is hoped that means will be found to diminish the proportion of return cases. It might be possible in most years, however, to reduce the number of children admitted, and to utilise any wards thus rendered available, for the reception of cases of Phthisis.

The relation of Enteric Fever to the consumption of shell-fish has received the attention of the Royal Commission on Sewage Disposal during the year 1903. After the issue of their 4th report, a meeting was convened of the Representatives of Local Authorities to urge on the Government the desirability of taking steps to secure the safety of shell-fish layings, which the Chairman of the Hospitals Sub-Committee attended.

On Enteric Fever a statement has been prepared by Dr. Forbes. He has also prepared the section on Diphtheria, and I would call attention to the useful work which he has done in connection with bacteria occurring in the ear-discharges of Scarlet Fever, which morphologically resemble those of Diphtheria.

Dr. Forbes has also done useful work in limiting the spread of Diphtheria in schools by calling at the homes of patients, and taking specimens for examination from persons who have been in contact with cases of Diphtheria. It has thus been possible to limit the movements of infective individuals.

If such measures could generally be adopted the disease would be still further checked. We are restricted by want of staff trained for this purpose.

There can be little doubt that Scarlet Fever is spread by persons who have been in contact with the sick, but who have not themselves shown signs of illness, just as happens in the case of Diphtheria, and further precautions are called for.

An account of the work done during the year under the scheme for the voluntary notification of Phthisis has been prepared by Dr. Cowie. His remarks on the occurrence of Phthisis in schools deserve attention.

The immediate need is for hospital accommodation for cases occurring in crowded households, whether in the early or late stage of the disease.

There appears to be a reasonable probability that 40 beds will be at the service of the Corporation in the course of next year, but we ought to have a larger provision than this.

It does not appear to me that the presence of Fever or Smallpox within the same hospital precincts need be prohibitive of the treatment of cases of Phthisis. Certain precautions would, of course, require to be taken.

The mortality from Measles again increased in 1903, and a report is presented making further recommendations in regard to this fatal disease. Whooping Cough may well be allowed to wait until the difficulties of dealing with Measles are overcome.

The problem of Diarrhœa is always with us, and a brief section is devoted to it. Additional measures are this year being taken in the hope of diminishing the Autumn mortality.

The report of the Veterinary Surgeon on the working of the Manchester Milk Clauses, etc., shows that substantial progress has been made as regards the improvement of cowsheds within the City, only about 30 remaining unaltered. The report presents internal evidence that the Milk Clauses are being carefully and, on the whole, successfully worked. They are open to evasion in various directions, and the Clauses which were inserted in, and subsequently taken out of, the Manchester Bill for 1904 embodied an effort to prevent the Clauses from becoming abortive by evasion.

The need for increased stringency is shown by the circumstance that the proportion of milks taken at railway stations proved to be tubercular has increased. There is produced an impression that the conditions under which milk is produced at present outside the City are quite unsuitable, and need radical changes.

A statement is presented of the work done under the Factory and Workshops Act, 1901. The Sub-Committee administering the Act have visited nearly all the underground bakehouses in the City, and have determined under what conditions a certificate shall be given.

The question of housing the working classes is briefly considered. Increased facilities for travel to the outskirts will do much to avert from Manchester the serious evils connected with overcrowding. The increased space required for schools, and the insanitary condition of certain areas will produce displacements which must, at least partially, be met by re-constructions in the districts affected. These can only be carried out adequately in crowded districts by means of blocks of tenements.

Further sections of the Report refer to the Midwives Act, 1902, and the work of the Ladies' Health Society.

Dr. Gordon presents a Report on Monsall Hospital. Further Reports are included; by Mr. Rook on the work of the Sanitary Department, by Mr. Holburn on the Inspection of Food, and by Mr. Williamson on the work of the Cleansing Department.

I have the honour to be,

My Lord Mayor and Gentlemen,

Your obedient Servant,

JAMES NIVEN,

Medical Officer of Health.

TABLE OF CONTENTS.

	PAGE
STATISTICAL—(1903)	1–22
GENERAL STATISTICS, WITH SPECIAL REFERENCE TO THE PHYSICAL PROGRESS OF THE COMMUNITY	22–46
NOTIFIED INFECTIOUS DISEASES	47
Smallpox	48–83
Administrative Work	48–55
Overlooked cases	55–61
Influence of common lodging-houses	61–62
Tramps	62
Influence of public-houses	62
And places of work	62
Vaccination and schools	62–64
Treatment of cases in Clayton Hospital	64–67
Vaccination	66–79
Second attacks of	79
Evidence of disease from vaccination	79–80
Complications	80
Fatal cases, particulars of	82
Staff	83
Scarlet Fever	83–103
Tables regarding 1903	84–86
Decrease of	87–89
And rainfall	89–91
Direct transmission	91
Micro-organisms	92
Hospital influence	96
Return cases of	93–99
Removal of cases	94
Progression of, in districts	95–96
Overlooked cases	97
And schools	103
Sources of infection	103

PAGE

NOTIFIED INFECTIOUS DISEASES—continued.

Diphtheria and Membranous Croup 104–119
Seasonal incidence 104
And rainfall 105
Bacteriological examination of cases in months 106–107
Tables regarding 108–109
School infection 111
Contacts 113–118
Effect of removal to hospital 116
Bacteriology—Analysis of work 119

Enteric or Typhoid Fever 120–137
Tables regarding 120–123
And flies 123
And shell-fish 124–129
Direct infection 130–136
Outside infections 137
Bacteriological examinations 137

MEASLES 138–158
And schools 138
Tables regarding 138–140
Special report regarding 141–158

WHOOPING COUGH 159–160
Tables regarding 159–160

SUMMER DIARRHŒA 160–170
Tables regarding 161–163
Effect of season 163
And flies 168
District mortality 169
Propositions 169–170

VOLUNTARY NOTIFICATION OF PHTHISIS 170–187
Notifications 171–173
Deaths 172–173
Administrative action 174–187
Supervision of cases 174
Cleansing and disinfection 175
Deaths amongst notified cases 176
History of infection 177
Occupations 181
And schools 182–184
Personal habits 186
Predisposing illnesses 186

PAGE

Milk and Tuberculosis 187–206
Manchester cowsheds 188
Manchester cows 191
Milk clauses 192
Tuberculous milks 192
Disposal of cows having tuberculous udders 198–206

The Factory and Workshop Act (1901) 206–212
Administration of 207
Summary of work by Inspectors 207–210
Classification of outworkers 211

Bakehouses 212–215

Housing of the Working Classes 215–227

Midwives' Act, 1902 227

Work of the Ladies' Public Health Society 227–230

Work of the Ladies' Society for Visiting the Jewish Poor ... 227–230

Medical Superintendent's Report on Monsall Hospital 230–248

Work of Sanitary Department 248–264

Work of Cleansing Department 265–266

Work of Markets Department *re* Unwholesome Food 267–276

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LIST OF TABLES.

TABLE		PAGE
1.	Recorded and Corrected Death-rates in 76 Towns	2–3
2.	Deaths in Public Institutions, 1903	6
3.	Prices of Flour, Butchers' Meat, and Coal, 1903	7
4.	Annual Rates of Mortality, 1903, at 12 groups of ages, amongst persons—males and females	16
5.	Death-rates in the Homes of the People, in Workhouses, and in Hospitals	18

Table showing Death-rates in age-groups in males, 1841-1845 compared with 1896-1900 28

—— Do. do. females 28–29

—— showing Death-rates in age-groups in decennial periods, 1851-1900 31

—— Do. do. Manchester Township 31

—— showing Death-rates in age-groups for City and three Townships 37

—— Do. do. do from Phthisis 37

—— showing Notifications of Infectious Diseases, 1893-1903 47

—— of Deaths from 47

Tables relating to Smallpox 49, 51, 55, 56, 59, 60, 66, 67, 69–78, 80, 81

—— relating to Scarlet Fever in 1903 84–86

Table showing Annual Death-rates from Scarlet Fever and Measles, 1866-1900 87

Tables showing rainfall in third quarters, and deaths from Scarlet Fever in third and fourth quarters, 1891-1903 90

Table showing rainfall, Scarlatinal mortality, Death-rates, and incidence rates, 1891-1903 91

—— showing Death-rates and percentage of removals to Hospital for City and Manchester Township, 1891-1903 94

—— showing seasonal incidence in Diphtheria 104

—— showing Diphtheria attacks in Districts and Months, showing Bacteriological Results 106–107

PAGE

Tables relating to Diphtheria and Membranous Croup in 1903 108–110
—— relating to Enteric Fever in 1903 120–123
—— showing Enteric Fever Cases traced to Shell-fish.....124–127
—— showing Enteric Fever Cases traced to direct infection 130–136
—— relating to Measles in 1903 138–140
—— relating to Whooping Cough in 1903 159–160
—— relating to Diarrhœa, &c., in 1903 161–163
—— relating to Phthisis, 1903.....171, 172, 176, 178, 180, 186
Table showing work done under Factory and Workshop Act ... 207, 208–210
—— showing classification of outworkers 211
—— showing new houses fit for habitation in Manchester..... 216
—— Do. do. in outside districts 217
—— showing number of houses closed, demolished, &c. 218, 219
—— showing number of tenements—London, Liverpool, Glasgow, and Manchester..... 222, 223
—— showing work of Ladies' Health Societies 228

TABLE

A. Causes of Mortality at certain age-groups, 1903 278–281
B. Causes of Mortality of Males, at age-groups, 1903 282
C. Do. Females, do. do. 283
D. Causes of Mortality in Infancy and Childhood, 1903 284
E. Population ; Marriage, Birth, and Death Rates, 1871–1903 ... 285–286
F. Rates of Mortality from certain causes, 1881–1903..... 287
G. Population, Area, Density, Births, and Deaths, with Rates, 1903 ... 288
H. Illegitimacy and Infantile Mortality, 1903 289
J. Infantile Mortality in Divisions, 1903 290
K. Mortality from all causes in Divisions, 1903 291
L. Certification of Cause of Death, 1903..... 292
M. Mortality at age-groups (City) 293
N. Do. do. in Divisions 294
O. Patients admitted to Isolation Hospitals, 1903 295
P. Work of Sanitary Department, 1903..... 296

LIST OF CHARTS.

PAGE

A. and B. Showing the relation between Rainfall and Diphtheria attack-rate and death-rate 104

ANNUAL REPORT.

STATISTICAL.

The following are general statistics for the year 1903:—

Area of the City in acres			12,910
Estimated population at the middle of 1903	Males	268,352	554,331
	Females	285,979	
No. of persons per acre			43
No. of inhabited houses at the Census taking, 1901			108,957
No. of uninhabited houses at the Census taking, 1901			8,559
Total No. of tenements			112,854
No. of tenements at the Census taking, 1901, 4 rooms and under			61,572
Average No. of persons at the Census taking, 1901, in houses of 4 rooms and under			4·25
Persons married per 1000 of population in the Manchester, Chorlton and Prestwich Unions			17·75
Births in the City of Manchester	Males	8,799	17,569
	Females	8,770	
Annual birth-rate per 1000 of population			31·7
Deaths	Males	5,636	10,782
	Females	5,146	
Annual death-rate per 1000 of population	Males	21·00	19·45 persons
	Females	17·99	
Deaths under 1 year of age per 1000 births			168·5
Excess of registered births over deaths			6,787
Estimated increase of population during the year			3,976

TABLE I.—RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS LIVING IN 76 GREAT TOWNS IN 1903.

TOWNS, in the order of their Corrected Death-rates	Standard Death-rate *	Factor for Correction for Sex and Age Distribution †	Recorded Death-rate, 1902	Corrected Death-rate, 1902 ‡	Comparative Mortality Figure, 1902 §
Cols.	1	2	3	4	5
England and Wales	18·21	1·0000	15·41	15·41	1,000
England and Wales, less the 76 Towns.....	18·84	0·9666	14·72	14·23	923
76 Towns	17·14	1·0624	16·26	17·27	1,121
Hornsey.....	15·95	1·1417	7·85	8·96	581
King's Norton	17·40	1·0466	9·96	10·42	676
Leyton	17·69	1·0294	10·80	11·12	722
Handsworth (Staffs.).....	16·55	1·1003	10·40	11·44	723
East Ham	17·06	1·0674	10·96	11·70	759
Walthamstow.....	17·20	1·0587	11·10	11·75	762
Croydon.....	17·75	1·0259	11·83	12·14	788
Hastings.....	18·92	0·9625	12·89	12·41	805
Bournemouth	17·25	1·0557	12·10	12·77	829
Willesden	16·98	1·0724	12·11	12·99	843
Reading.....	17·57	1·0364	12·71	13·17	855
Burton-on-Trent	16·93	1·0756	12·32	13·25	860
Southampton.....	18·30	0·9951	13·78	13·71	890
Tottenham.....	16·87	1·0794	13·03	14·06	912
Brighton.....	18·47	0·9859	14·27	14·07	913
Barrow-in-Furness.....	16·01	1·1374	12·73	14·48	940
Norwich.....	19·04	0·9564	15·23	14·57	945
Derby.....	16·89	1·0782	13·59	14·65	951
Bristol	17·73	1·0271	14·28	14·67	952
Northampton.....	17·55	1·0376	14·19	14·72	955
Smethwick.....	16·65	1·0937	13·48	14·74	957
Devonport.....	17·35	1·0496	14·13	14·83	962
Ipswich	18·64	0·9769	15·24	14·89	966
Portsmouth	17·75	1·0259	14·75	15·13	982
Leicester	17·05	1·0680	14·21	15·18	985
Wallasey	16·63	1·0950	13·86	15·18	985
Grimsby.....	17·01	1·0705	14·19	15·19	986
Cardiff	16·74	1.0878	13·99	15·22	988
Aston Manor.....	16·41	1·1097	13·89	15·41	1,000
West Hartlepool	16·59	1·0976	14·29	15·68	1,018
Plymouth	18·68	0·9748	16·51	16·09	1,044
Wolverhampton.....	17·59	1·0352	15·54	16·09	1,044
Coventry	18·18	1·0017	16·17	16·20	1,051

* The Standard Death-rate signifies the rate at all ages calculated on the hypothesis that the rates for each sex at each of twelve age-periods in each town were the same as in England and Wales during the ten years 1891–1900, the rate at all ages in England and Wales during that period having been 18·21 per 1,000.

† The Factor for Correction is obtained by dividing the Standard Death-rate in England and Wales by the Standard Death-rate in each town, and is the figure by which the Recorded Death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The Corrected Death-rate is the Recorded Death-rate multiplied by the Factor for Correction.

§ The Comparative Mortality Figure represents the Corrected Death-rate in each town compared with the Recorded Death-rate at all ages in England and Wales in 1902, taken as 1,000.

TABLE 1. (continued)—RECORDED AND CORRECTED DEATH RATES PER 1,000 PERSONS LIVING IN 76 GREAT TOWNS IN 1903—*continued.*

TOWNS, in the order of their Corrected Death-rates	Standard Death-rate*	Factor for Correction for Sex and Age Distribution †	Recorded Death-rate, 1902	Corrected Death-rate, 1902‡	Comparative Mortality Figure, 1902 §
Cols.	1	2	3	4	5
Halifax	16·78	1·0852	15·02	16·30	1,058
West Ham	17·03	1·0693	15·26	16·32	1,059
London	17·32	1·0514	15·67	16·48	1,069
Great Yarmouth	19·84	0·9178	18·16	16·67	1,082
York	17·69	1·0294	16·27	16·75	1,087
Stockton-on-Tees	17·37	1·0484	16·00	16·77	1,088
West Bromwich	18·04	1·0094	16·81	16·97	1,101
Newport, Mon.	16·83	1·0820	15·71	17·00	1,103
Hull	17·78	1·0242	16·92	17·33	1,125
Walsall	17·18	1·0600	16·45	17·44	1,132
Gateshead	17·27	1·0544	16·73	17·64	1,145
Blackburn	16·10	1·1311	15·73	17·79	1,154
Nottingham	17·28	1·0538	16·93	17·84	1,158
Birkenhead	17·06	1·0674	16·76	17·89	1,161
Huddersfield	16·95	1·0743	16·73	17·97	1,166
Leeds	16·68	1·0917	16·56	18·08	1,173
Bradford	16·47	1·1056	16·39	18·12	1,176
South Shields	17·19	1·0593	17·18	18·20	1,181
Rhondda	16·55	1·1003	16·56	18·22	1,182
Rotherham	17·57	1·0364	17·63	18·27	1,186
Tynemouth	17·64	1·0323	18·17	18·76	1,217
Rochdale	16·46	1·1063	17·15	18·97	1,231
Birmingham	16·92	1·0762	17·78	19·13	1,241
St. Helens	16·80	1·0839	17·71	19·20	1,246
Bury	16·25	1·1206	17·32	19·41	1,260
Bolton	16·09	1·1318	17·46	19·76	1,282
Stockport	16·87	1·0794	18·45	19·91	1,292
Swansea	16·97	1·0731	18·59	19·95	1,295
Sheffield	16·89	1·0782	18·62	20·08	1,303
Warrington	16·87	1·0794	18·67	20·15	1,308
Merthyr Tydfil	17·19	1·0593	19·07	20·20	1,311
Hanley	16·69	1·0911	18·69	20·39	1,323
Preston	16·63	1·0950	18·68	20·45	1,327
Sunderland	17·66	1·0311	19·94	20·56	1,334
Newcastle-on-Tyne	16·88	1·0788	19·22	20·73	1,345
Oldham	16·18	1·1255	18·62	20·96	1,360
Salford	16·47	1·1056	18·97	20·97	1,361
Bootle	16·48	1·1050	19·04	21·04	1,365
Burnley	16·14	1·1283	19·16	21·62	1,403
Liverpool	17·02	1·0699	20·48	21·91	1,422
Manchester	16·30	1·1172	19·72	22·03	1,430
Middlesbrough	16·71	1·0898	21·53	23·46	1,522
Wigan	16·49	1·1043	22·16	24·47	1,588

For Notes * † ‡ § see page 2.

The principal causes of death during the year were :—

Phthisis	1025	Premature Birth	367
Tuberculosis of Organs other than the Lungs	422	Nephritis and Bright's Disease	203
Diseases of the Heart ...	890	Convulsions	198
Cerebral Hæmorrhage, Apoplexy, Hemiplegia	402	Inflammation of the Brain ...	158
Pneumonia	1034	Diarrhœa and Dysentery ..	507
Bronchitis	1034	Measles 345	
Atrophy Debility (chiefly in infants)	620	Scarlet Fever... 97	791
Old Age...	213	Whooping Cough 213	
		Diphtheria 136	
		Malignant Disease	424

Table I, extracted from the Registrar-General's Annual Summary, shows Manchester again in a low position, standing seventy-fourth out of the 76 large towns.

The calculated death-rate for the year 1903 is the lowest on record, and having regard to the considerable excess of the natural over the calculated increase of population in the last three years, it does not appear probable that the figure is over the mark, as it certainly was in 1894.

The birth-rate does not reach the high level which it attained in 1902, and is lower than in any previous year except 1901.

This may possibly mark the commencement of a decline of employment in the City in 1902.

The percentage of illegitimate births is 4·1, which is somewhat in excess of that prevailing in recent years, though under the average for the previous ten years.

From Table E it will be seen that over one quarter of the deaths occurred in public institutions, a proportion decidedly in advance of any in previous years. This must mark a decided diminution in the general wellbeing, and the figures given in Table 5, showing the distribution of death-rates occurring for each district of the City at home, in the Union Hospitals, and in other Public Institutions, confirm this impression.

If we take the ratio of the death-rates for the whole City occurring at home to those occurring in the Union Hospitals and in other public institutions, we get the following figures :—

Ratio of Home Mortality to Mortality in	1895	1896	1897	1898	1899	1900	1901	1902	1903
Union Hospitals	6·5	6·5	6·2	6·4	6·0	5·2	5·2	5·2	4·8
Other Public Institutions	11·8	10·9	11·2	11·9	12·6	11·4	9·3	8·3	7·6

We thus see that an abrupt increase in the treatment of fatal disease occurred in 1901, both in the Union Hospitals and in other public institutions, which underwent further extension in 1903. It is impossible to doubt that this marks increased poverty in the City generally, and an increase so great as to be very serious in its import. Figures for the three main divisions of the City all show the same thing.

These figures indicate, also, that the distress was already, in 1903, severe amongst those classes of the population who are with difficulty induced to have recourse to the Union Hospitals. The number of deaths occurring in the various Hospitals is shown in the following table.

Table 2.—Populations—Deaths of Manchester Residents, 1903, in Public Institutions.

Township	Name of Institution	Census Population, 1901	Deaths, 1903
Ancoats	Ancoats Hospital	90	141
	Workhouse Casual Wards (Tame Street)	185	1
Central	Workhouse Casual Wards	176	4
	Royal Infirmary	274	318
	St. Mary's Hospital	59	17
	Lock Hospital	26	1
	Eye and Ear Hospital	9	1
	Wood Street Mission	18	...
	Chetham Hospital	100	...
	Skin Hospital	...	2
St. George's	Girls' Home (Charter Street)	36	...
Cheetham	His Majesty's Prison	1,028	4
	Boys' Refuge	220	...
	Northern Hospital (late Clinical)	50	70
	Fairy Hill Home for Working Lads	56	...
Crumpsall *	Manchester Workhouse	2,767	826
	Prestwich Workhouse	504	144
Blackley	Manchester and Salford Reformatory	91	...
	Litchford Hall	231	3
Moston	St. Mary's Home	45	5
	St. Joseph's Home	50	...
	St. Bridget's Orphanage	27	...
Newton	Monsall Hospital	428	223
	Little Sisters of the Poor (Culcheth Hall)	165	3
Clayton	Clayton Hospital	20	24
Ardwick	Industrial School	204	...
	Nicholls Hospital	96	...
Openshaw	Crossley's "Home of Peace"	10	19
Rusholme	St. Joseph's Girls' School	176	1
	St. Mary's Home	61	...
Chorlton-on-Medlock	St. Joseph's Boys' School	418	...
	Royal Eye Hospital	103	1
	Little Sisters of the Poor (Plymouth Grove)	199	25
	Casual Wards (All Saints)	...	2
	Southern Hospital	28	13
	Cancer Hospital	14	21
	Maternity Home	9	4
	Home for Young Girls	25	...
	Church Army Labour Home	20	...
	Penitentiary	42	...
Hulme	Cavalry Barracks	489	...
	Loretto Convent	81	...
* Outside City.	Withington Workhouse	2,013	690
	Pendlebury Hospital	180	47
	Prestwich Lunatic Asylum	2,614	67
	St. Anne's Home, Dunham Massey	...	2
	St. Joseph's Home, Eccles	...	2
	Infirmary and Robinson Kay Home for Incurables, Bury	...	3
	Workhouse and Infirmary, Stockport	...	6
	Parish Workhouse and House of Providence, Liverpool	...	2
	Salford Dispensary, Bethesda, Hope, and Workhouse Hospitals	...	17
	County Asylum, Lancaster	...	15
	Knutsford Workhouse	...	1
	His Majesty's Prison, Walton	...	1
	Total Deaths		2,726

* Proportion only.

TABLE 3.—TOWNSHIP OF MANCHESTER.—PRICES PAID BY THE GUARDIANS FOR FLOUR, BUTCHERS' MEAT, AND COAL, ALSO THE AVERAGE WEEKLY NUMBER OF PERSONS IN RECEIPT OF RELIEF, DURING THE YEARS 1887–1903.

YEAR ENDING	PRICES OF PROVISIONS					PAUPERISM		BIRTH-RATE PER 1,000
	Flour per Sack of 280lbs.	Butchers' Meat, per lb.			Coal, per ton	Average number of Paupers relieved in each week		
		Beef		Mutton	Engine / House	Indoor	Outdoor	
		Coarse	Fine					
1887	25/2 to 30/6	-/3¾	-/6½	-/6½	5/6 / 8/4	3123	877	33·9
1888	24/- to 29/3	-/3¾	-/6½	-/6½	5/5 / 8/3	3130	713	33·3
1889	24/11 to 31/2	-/4½	-/6½	-/6½	5/8 / 8/7	3037	632	33·1
1890	24/9 to 29/11	-/5	-/7	-/7	7/- / 9/9	2998	498	31·8
1891	27/3 to 28/11	-/4¼	-/6½	-/6½	8/8 / 11/2	3118	466	33·8
1892	26/4 to 28/5	-/4	-/6¼	-/6¼	7/6 / 10/2	3251	551	33·4
1893	21/8 to 25/1	-/3⅞	-/6¼	-/6¼	6/5 / 10/0	3277	586	33·4
1894	17/2 to 23/9	-/3¾	-/6	-/6	7/1 / 10/10	3328	395	31·8
1895	15/6 to 21/-	-/3¾	-/6	-/6	5/6 / 10/3	3343	618	33·4
1896	16/6 to 24/-	-/3⅝	-/5¾	-/5¾	5/7 / 9/1	3348	533	32·8
1897	17/3 to 33/9	-/3½	-/5⅝	-/5⅝	5/9 / 8/8	3476	697	32·9
1898	26/7 to 33/8	-/3½	-/5½	-/5½	6/2 / 8/4½	3519	732	32·3
1899	20/11 to 23/-	-/3½	-/5⅝	-/5⅝	7/5 / 9/11	3232	597	32·2
1900	20/9 to 22/9	-/3½	-/5½	-/5⅝	11/9¾ / 14/2½	3189	686	32·4
1901	21/4 to 23/3	-/3⅝	-/5⅝	-/5⅝	11/8 / 15/2	3403	817	28·7
1902	20/11 to 24/3	-/3⅞	-/5¾	-/5¾	9/3 / 13/5½	3492	752	33·0
1903	21/10½ to 23/3	-/4⅜	-/6	-/5½	9/- / 12/11¼	3521	812	31·7

It is certainly remarkable that, in this year, there should have been a death-rate so low for Manchester, and we, therefore, turn with interest to the Table showing the prices of Provisions and Fuel as paid by the Guardians of the Manchester Township (Table 3). We here find that the prices of the cheaper flours and of beef have advanced, while those of mutton and house coal were lower than in previous years. The price of food was, on the whole, increased.

The numbers of persons in receipt of indoor and of outdoor relief were, as was to be expected, considerably increased.

It would be a valuable addition to this table, if the changes in house rents could be ascertained, as well as the alteration in prices of clothing.

The principal gains and losses in the death-rate, as compared with the average death-rates of the previous ten years, are shown in the following figures :—

Gains in 1903 per 1000 persons living.

Measles	0·12
Scarlet Fever	0·06
Influenza	0·12
Whooping Cough	0·12
Enteric Fever	0·01
Diarrhœal Diseases	0·59
Erysipelas	0·07
Puerperal Fever	0·03
Phthisis	0·21
Abdominal Tuberculosis	0·02
Other Tuberculosis	0·12
Alcoholism	0·02
Rheumatic Fever	0·02
Nervous Diseases	0·12
Heart Diseases	0·06
Bronchitis	0·34
Pneumonia	0·59
Other Respiratory Diseases	0·11
Digestive Organs	0·04
Urinary organs	0·04
Old Age	0·05
Total	2·86

Losses in 1903.

Smallpox	0·03
Diphtheria	0·05
Tuberculous Meningitis	0.02
Cancer	0·05
Premature Birth	0·05
Total	0·20
Balance	2·57
All Causes	2·90

We have, therefore, accounted in the above figures for nearly the whole of the gain.

Of the total figure 2·86, Respiratory Disease, including Phthisis, Pneumonia, and Bronchitis, accounts for 1·25, and Diarrhœal Diseases for 0.59. These are, therefore, the principal headings under which improvement has occurred.

It will be noted that Diarrhœa and Lung Diseases, other than Phthisis, are greatly influenced by season; yet it is certainly ground for satisfaction that the death-rate for Respiratory Diseases other than Phthisis is the lowest yet recorded.

It is deserving of notice that the death-rate from Phthisis is much the lowest on record, and it may be hoped that this improvement is in some measure due to administrative action.

The death-rates show a slight decline under all the factors which we may associate with Alcoholism, viz. : Alcoholism, Nervous Diseases, Heart Disease, Chest Diseases, Diseases of the Digestive Organs, and Urinary Diseases.

The death-rate from Cancer remains high, but is less than in the previous two years.

It is matter for satisfaction that the death-rates from Puerperal Fever, Erysipelas, and Septic Diseases have diminished.

As regards the Infectious Diseases, there is a general improvement as compared with the ten previous years, but it would be unsafe to build any conclusion on this. The death-rate from Measles is ascending.

Tables E and F permit us to compare the death rate taken on the whole population of a number of causes of death in the last ten years with that prevailing in the previous ten years.

In comparing these death rates we have to remember that they give only a rough idea of the relative severity of the diseases in different years, owing chiefly to the changing age constitution of the population.

We are first struck by the comparatively slight mortality from Smallpox during the last two decennia.

From Measles, on the other hand, there has been an increased death rate.

Another disease of which this can be affirmed is Summer Diarrhœa, and it is a very strange thing that such should be the case, since it is precisely in regard to Diarrhœa that there is believed to be a special association with dirty conditions. Now, I believe there is no doubt that, in the matter of cleanliness, improvement has occurred both outside and inside the houses.

It is probable, however, that the prevention of Diarrhœa is dependent on various causes besides cleanliness, such as the extent to which mothers suckle their infants, maternal knowledge and care, good fresh milk, absence of crowding, natural vigour, and we must look to all these factors to take their share in producing Diarrhœal mortality.

Moreover, season has a very powerful influence, and possibly the whole of the increment in the Diarrhœal death-rate may be ascribed to seasonal influence. Of this we are not yet in a position to judge.

In Scarlet Fever a great improvement has taken place during the last ten years. This is also true of Diphtheria, though a tendency to increase is at present manifest. In Whooping Cough also improvement is apparent. Typhus has almost disappeared. Enteric Fever shows marked improvement. From Table F we find that Cancer has shown a steady growth of mortality up to 1903, when a slight recession occurred.

Tubercular disease shows a decided improvement during the ten years, although in 1901 and 1902 some retrogression was manifest. The recorded increase was apparently greater than the fact, however, the death rates prior to 1901 having been somewhat too low.

During the last six years an improvement has taken place under diseases of the nervous system, chiefly under the heading convulsions.

No corresponding improvement has occurred under diseases of the circulatory system, nor can it be said that any improvement was clearly shown under respiratory disease until 1903.

Improvement is manifest under diseases of the digestive system, though not under urinary or generative diseases.

Under the kindred heads of Puerperal Fever and Child-birth, however, a very marked improvement has occurred in recent years.

As has been shown in previous years, the most striking feature of this district is the high death-rate from Lung Disease, the causes of which cannot be said to be cleared up.

Statistics at Groups of Ages.

Lowered Infantile Mortality.

The infantile mortality has been usually considered as specially deserving of attention, as an index of sanitary condition. The indications which it affords, however, are complex, and depend in no small degree on social conditions. Partly it is associated with maternal health and maternal care, partly it is dependent on the facilities for the spread of infectious disease, partly it is dependent on want of cleanliness in and about the house, and partly it shares in the general effects of bad housing.

The infantile mortality for 1903 was 168·54 per 1,000 births, which is higher than in 1894 and 1902, but lower than in any other year since the incorporation of the City.

The causes of death most intimately associated with this age are Diarrhœa, Convulsions, Wasting Diseases, Lung Disease, and "Found Dead in Bed."

From Diarrhœa the death rate was higher than in 1891, 1892, 1894, and 1902, but considerably lower than in most years. It will be remembered that a wave of diarrhœal mortality extended from 1897 to 1901, and it is impossible to say whether the conditions as regards surface pollution, the milk supply, and maternal care have improved sufficiently to resist another such wave of high temperatures.

Greater use of water for general cleansing purposes, relaying of drains, substitution of water-closets for pails and middens, enforcement of cleanliness in the home, and better feeding and care of infants are all required to diminish the heavy loss which has been sustained in former years from this cause.

It is noticeable that the years in which the mortality ascribed to wasting disease has been highest, have been years of high diarrhœal mortality, and that summer diarrhœa is followed by an enfeebled condition of the bowels and by innutrition. It is possible, therefore, that mortality from wasting disease is due to diarrhœa to such an extent as to make it difficult to use it as a differential expression by itself of special factors, except in so far as these are causative also of diarrhœa.

It may be assumed, however, that a high steady mortality from wasting disease in infancy is proof of unfavourable social conditions.

The expression "Found Dead in Bed" is to a large extent synonymous with overlaying, and overlaying is certain to increase with increase of drunkenness in men or women. The absolute mortality is not high, but the figure is valuable for the reason given. It is practically identical with the figure for 1902, and is lower than the corresponding figure in any previous year.

From Convulsions, again there has been a greatly reduced death-rate since 1898, and the contrast between the death-rate of 9·16 in 1903 and 26·62 in 1891 is a striking one.

Yet the death-rate from this cause is higher than in 1896, 1899, 1900, and 1902.

Although "Convulsions" stands in relation with the onset of infectious disease, and the death rate may be expected to increase with the increase of such diseases as Measles, Whooping Cough, Scarlet Fever, and Diarrhœa, yet its main relation is with feeding, and the improvement which has occurred may be taken to show that the work expended on instructing mothers in the precautions to be adopted in feeding their infants has not been thrown away.

Wasting Diseases.

The mortality from this cause is to be taken as due partly to poor health in the mother, partly to maternal neglect, partly to poverty, and partly to want of cleanliness in and about the house. Partly, also, it is consequent on Diarrhœa.

The mortality is lower than in other recent years, except 1902, but higher than in some earlier years, namely, 1891, 1892, 1894, 1896, 1897.

Moreover, the difference is sharply marked, and it is probable, taking into account the differences under other headings relating to alcoholism, that there has been a decided improvement as regards drinking in the last two years.

Lung Diseases in infancy are connected with feeble natural constitution, with seasonal changes, with the town atmosphere, and with the prevalence of dirt, including infectious particles, in the atmosphere. A high mortality from respiratory disease may be taken to imply both feeble natural condition and dirty environment.

The mortality from this cause is in Manchester always high. In 1903, however, it was lower than in any previous year, except 1901.

The mortality from Whooping Cough reaches its maximum in the first year of life. In 1903 it is considerably under the average for ten years.

From Tubercular Disease, the mortality is lower than in any previous year except 1902. The diminution in infantile mortality from this cause in recent years is pronounced, and it is reasonable to suppose that the action taken under the Manchester Milk Clauses has had to do with this diminution.

Mortality in Childhood, 0–4.

The mortality in childhood is somewhat higher than in 1902, which established a favourable record for this age. Owing to the alteration in age distribution, which took place during the ten years 1891–1900, comparisons with the figures for years preceding 1902 have to be made with caution, and I have therefore had the corrected populations and death-rates calculated out since 1891 in groups of ages, as shown by the following table :—

Corrected Populations in Age Groups, 1891–1903.

Year	All ages	Under 5 years	5–15 years	15–25 years	25–45 years	45–65 years	65 years and upwards
1891	508,673	63,760	113,489	102,776	147,386	68,258	13,004
1892	512,135	63,776	113,289	103,682	149,087	69,040	13,261
1893	515,835	63,822	113,142	104,637	150,857	69,854	13,523
1894	519,561	63,871	113,001	105,596	152,635	70,671	13,787
1895	523,314	63,924	112,866	106,561	154,420	71,492	14,051
1896	527,094	63,980	112,736	107,532	156,214	72,316	14,316
1897	530,901	64,039	112,613	108,508	158,015	73,144	14,582
1898	534,736	64,101	112,495	109,490	159,825	73,977	14,848
1899	538,599	64,167	112,385	110,477	161,642	74,813	15,115
1900	542,490	64,236	112,276	111,471	163,471	75,653	15,383
1901	546,408	64,308	112,175	112,470	165,306	76,497	15,652
1902	550,355	64,773	112,985	113,283	166,501	77,049	15,764
1903	554,331	65,256	113,838	114,109	167,689	77,550	15,889

Corrected Death-rates in Age Groups, 1891–1903.

Year	All causes	Under 5 years	5–14 years	15–24 years	25–44 years	45–64 years	65 years and upwards
1891	25·97	86·6	4·80	5·65	13·93	40·4	134·2
1892	23·22	78·7	4·59	5·37	12·06	35·9	114·4
1893	24·35	86·3	4·73	4·94	12·51	35·3	121·7
1894	19·93	66·5	3·97	4·52	11·16	29·5	100·9
1895	24·68	90·7	4·67	5·19	11·92	35·9	116·0
1896	22·53	80·4	4·08	4·89	11·22	33·3	110·9
1897	22·58	85·3	3·94	4·54	10·24	32·4	109·9
1898	21·49	78·1	3·55	4·14	10·80	32·0	104·1
1899	24·22	87·5	4·22	4·86	11·80	36·4	118·6
1900	23·79	78·3	4·21	4·63	12·52	39·7	119·4
1901	21·60	74·5	4·44	4·40	10·48	34·2	106·0
1902	20·03	64·7	4·12	4·39	10·26	33·8	99·2
1903	19·45	69·5	3·71	4·05	8·99	29·7	97·5

This is the age group in which most infectious diseases exact their mortality.

As regards Measles, the death-rate is higher than in 1902, but does not approach that of the years of high measles mortality, viz., 1896, 1897, and 1899.

From *Scarlet Fever* the death-rate is lower than in previous years, with the exception of 1898 and 1899, when this disease sank to a very low mark.

Diphtheria and Membranous Croup show a higher death-rate than in any year since 1894.

There has been manifest in recent years a tendency towards an increase in this very fatal disease, and it is difficult to see how this tendency is to be arrested, except at a great expense of labour and skill. The difficulty in coping with it is that there are a large number of cases which escape attention, and which can only be detected, if at all, by a skilful physician with the aid of bacteriological examinations.

Moreover, to prevent its propagation, once it has appeared in a family, it would be necessary to give preventive injections of antitoxin, a procedure expensive and likely to be resisted by the family. Even when all this is done the remedy will be but partial.

The Causes of Death in the Early Years of Life in their Order.

If now we refer to Table D, we have presented to us a picture of the manner in which successive causes of death assail the child in the early years of life.

The largest proportion is taken from the first three months of life, under the headings: premature birth, wasting, and unclassified causes. Lung Diseases and Diarrhœa already carry away a large number.

In the second three months Diarrhœa and Lung Disease reach their maximum.

In the second half of the first year Whooping Cough reaches its highest point, and Lung Diseases have scarce begun to abate their severity. Diarrhœa continues to inflict great loss.

Measles already takes a large number.

In the second year of life Measles reaches its maximum, while Lung Diseases still maintain their rigour. Whooping Cough still carries off many. Diphtheria has now become formidable.

In the third, fourth, and fifth years of life Measles is still the cause of the highest death-rate after Diseases of the Lungs, though Scarlatina, Whooping Cough, and Diphtheria now produce a considerable mortality.

At ages 5–14—School age. The death-rate from all causes in 1903 was 3·71 per 1,000, the lowest point yet reached except in 1898.

At this age Tubercular Disease causes more than twice the mortality exacted by any other cause of death, Diseases of the Lungs, other than Phthisis, coming next. Nearly one-fifth of the total death-rate at this age, however, is due to Scarlet Fever, Diphtheria, and Enteric Fever combined.

Ages 15–24.—At these ages the death-rate shows a decline on all previous years. The principal cause of death is again Tubercular Disease, over one-third of the total deaths being from this cause. Diseases of the Heart and Lungs begin to exact a heavier toll. Enteric Fever is the chief infectious disease in evidence.

Ages 25–44.—Adult life. The mortality is more than double what it was at the last age group. From Tubercular Disease also the death-rate has more than doubled, while the death-rates from Heart Disease and Lung Disease have more than doubled. The death-rate from Tubercular Disease is, however, not much more than one-ninth of the total death-rate. Enteric Fever still causes a considerable number of deaths.

As compared with all former years the death-rate at this age group shows a marked reduction.

At ages 45–64 the death-rate is more than three times what it is at ages 25-44. The Diseases of the circulation now take first place, causing almost one-quarter of the total deaths. Respiratory Diseases, other than Phthisis, cause between one-quarter and one-fifth of all deaths. The mortality from Tubercular Disease still continues to increase, but relatively is smaller, being less than one-seventh of the total.

As compared with previous years the death-rate at these ages is lower, though not to the same proportionate amount as at ages 25–44.

At ages exceeding 65 the death-rates from Diseases of the Heart and Lungs quite outweigh that from other causes. As compared with previous years the death-rate at this age group is also lowered.

There was, thus, a general improvement at all ages, most marked at the higher age groups.

Male and Female Mortalities Compared.

The following table enables us to compare the rates of mortality in males and females, and also to follow more closely the manner in which the death-rate changes at twelve different groups of ages. We perceive that it is very high at birth and descends steeply up to the ages 10 to 15, after which it ascends more slowly, but with irregular rates of acceleration,

TABLE 4.—ANNUAL RATES OF MORTALITY IN MANCHESTER IN THE YEAR 1903, AT TWELVE GROUPS OF AGES AMONGST PERSONS—MALES AND FEMALES.

GROUPS OF AGES	PERSONS			MALES			FEMALES		
	Estimated Population	Deaths	Death-rates	Estimated Population	Deaths	Death-rates	Estimated Population	Deaths	Death-rates
All Ages	554,331	10,782	19·45	268,352	5,636	21·00	285,979	5,146	17·99
0 —	65,256	4,538	69·54	32,473	2,396	73·78	32,783	2,142	65·34
5 —	58,110	275	4·73	28,840	139	4·82	29,270	136	4·65
10 —	55,728	147	2·64	27,941	75	2·68	27,787	72	2·59
15 —	55,639	188	3·38	26,993	88	3·26	28,646	100	3·49
20 —	58,470	274	4·69	27,519	144	5·23	30,951	130	4·20
25 —	97,310	634	6·52	46,981	358	7·62	50,329	276	5·48
35 —	70,379	874	12·42	34,541	490	14·19	35,838	384	10·71
45 —	48,771	1,080	22·14	23,523	617	26·23	25,248	463	18·34
55 —	28,779	1,223	42·50	13,119	643	49·01	15,660	580	37·04
65 —	12,439	1,011	81·28	5,180	467	90·15	7,259	544	74·94
75 —	3,220	473	146·89	1,173	198	168·80	2,047	275	134·34
85 +	230	65	282·61	69	21	304·35	161	44	273·29

At all ages except 10-14 the male death-rate exceeds the female, the difference being least in childhood.

The large differences during the child-bearing ages would seem to indicate that Puerperal Fever and accidents of child-birth do not greatly exceed in their severity the small mortalities shown by the deaths registered as from these causes.

The difference in mortality between males and females is over one-seventh of the total death-rate.

Vital Statistics, Different Sanitary Districts.

Although the general birth-rate has declined, there is not a general decline throughout the districts. The inequalities are greater than usual.

The districts in which the birth-rate remains high form a continuous area, dividing North from South Manchester, viz. :—Cheetham, St. George's, Ancoats, Beswick, Bradford, Ardwick, and Openshaw. To the South the populous district of Hulme retains its high birth-rate.

The Districts of West Gorton to the South, and Harpurhey, Newton, and Clayton to the North, have a lower birth-rate than usual.

The percentage of illegitimate children is somewhat below the average. It is highest in the Central District, in Crumpsall, in Ardwick, and in Chorlton-upon-Medlock. In the Central District it attains the high figure of 8·9. The excess of illegitimacy in Crumpsall and in Chorlton-upon-Medlock is persistent.

As usual, the mortality amongst illegitimate infants is excessive, though it is not over twice that amongst legitimate infants, as is usually the case.

Death-rates in the Three Main Divisions of the City.

Although the total death-rate is lower than usual the differences between the main divisions of the City remain as sharply marked as ever.

The figures are contained in Tables 6, G, J, K, and M.

From Table G we find that the death-rate in the Manchester Township reached the comparatively low figure of 25·26, the death-rate in South Manchester being 19·31, and in North Manchester 15·20.

Corresponding differences exist in the infantile mortality, though these are not nearly so great as the differences in the total death-rates.

The reason for this is seen on reference to Table 5, which gives the death-rate for different districts of persons dying at home, in the workhouse, and in other public institutions.

TABLE 5.—1903.—DEATH-RATES * IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY.

STATISTICAL DIVISIONS		Estimated Populations †	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Workhouses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000	Mean death-rate 1881–1900
City of Manchester		**554,331**	**14·53**	**3·02**	**1·90**	**19·45**	**23·28**
I.	Manchester Township	132,160	16·17	6·27	2·83	25·26	30·04
II.	Northern Districts	172,289	12·75	0·86	1·59	15·20	18·31
III.	Southern Districts	249,882	14·90	2·79	1·62	19·31	22·24
I.	Ancoats	44,437	17·58	4·59	3·47	25·63	30·37
	Central	28,525	14·44	9·61	3·02	27·06	30·98
	St. George's	59,198	15·95	5·91	2·26	24·12	29·46
II.	Cheetham	38,778	9·95	0·72	1·78	12·46	14·50
	Crumpsall	9,051	10·39	0·55	1·38	12·26	15·48
	Blackley	9,174	12·86	0·76	2·29	15·91	17·95
	Harpurhey	17,809	11·34	0·51	0·95	12·80	19·01
	Moston	14,241	10·11	0·28	1·40	11·80	14·11
	Newton Heath	37,143	14·16	1·16	1·53	16·85	19·55
	Bradford	24,311	17·32	1·32	1·81	20·44	23·36
	Beswick	11,987	13·85	1·08	1·92	16·85	20·30
	Clayton	9,795	14·29	0·71	1·02	16·03	17·18
III.	Ardwick	42,618	14·97	1·83	1·71	18·51	21·73
	Openshaw	27,890	15·20	1·76	1·26	18·21	21·67
	West Gorton	30,315	13·52	2·21	1·39	17·12	21·52
	Rusholme and Kirk	25,533	12·61	1·37	0·98	14·96	16·05
	Chorlton-on-Medlock	57,398	13·54	3·85	2·04	19·43	21·34
	Hulme	66,128	17·41	3·75	1·71	22·86	25·42

* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.

‡ Population estimated to middle of 1903.

From Table 5 we find that over one-third of all deaths belonging to the Manchester Township occurred in public institutions, including the Union Hospitals, while in South Manchester the proportion was considerably under a quarter, in North Manchester under one-sixth.

The differences in the proportion of deaths occurring in the workhouse hospitals alone were still greater.

No small proportion of these deaths were of persons residing in common lodging-houses, or of persons whose modes of life and housing were not widely different from these.

In order, then, to obtain a fair idea of the extent to which insanitary conditions affect the persons inhabiting the ordinary houses in the City as distinguished from common lodging-houses, we must first eliminate the death-rates of persons dying in the Union Hospitals. If we wish to have an estimate of the effect of insanitary conditions apart altogether from poverty, we must take the death-rates apart from either the union or the institution death-rates (see Table 5), when we find that the differences in death-rate between the Central Division and the more out-lying districts are greatly reduced, though still in evidence. It thus appears that social conditions have a very great influence on the production of a high death-rate.

There can be no doubt, I think, that the death-rate in the central parts of Manchester is due to imported disease to no small extent, and that, if one may be allowed the expression, it is by no means all manufactured in Manchester.

As regards the causes of death in the different districts, these may be classified according as the death-rate is steadily highest year by year in the Manchester Township, and higher in South than in North Manchester, and according as this is only occasionally true.

Class 1. This applies to Diarrhœal Diseases, Phthisis, Alcoholism, Heart Disease, Bronchitis, and Pneumonia.

Class 2 (*a*) Where the above order holds in 1903, as for Measles, Puerperal Fever, Erysipelas, Septic Diseases, Cancer, Premature Birth, Nervous Diseases, diseases of the digestive and urinary organs, and Smallpox.

(*b*) Where the death-rate is highest in South Manchester in 1903, as in the cases of Diphtheria, Whooping Cough, Tubercular Disease other than Phthisis, and old age.

(*c*) Where it is highest in North Manchester, as for Scarlet Fever and Influenza.

The same gradation in mortality from the Central district to South Manchester, and from South to North Manchester is seen at every age group in Table N.

The differences are greatest, however, at ages 0–4, and at the age groups 25 to 44 and 45 to 64.

Whatever be the influences at work, it is evident, quite apart from the effect of common lodging-houses, that the health of the inhabitants of the Central District is much below the standard of the other main divisions.

The differences are well marked at every age group in respect of those diseases, which have been already mentioned as affected with constant differences.

Diarrhœa is fatal principally in infancy, and the number of deaths in the first year of life per 1,000 births is twice as great in the Manchester Township as in North Manchester.

The discrepancy is even greater at ages under 5 years, which shows that the disease reaches up to a higher age in the centre of the City.

From Tubercular disease the differences are always strongly marked. Under 5 years of age both the Central districts and South Manchester have death-rates more than double that in North Manchester.

Between the ages of 5 and 14 the death-rate of the Manchester Township is again nearly three times that of North Manchester.

At ages 15-24 the death-rate in the Manchester Township is unusually low, and is just equal to that of North Manchester.

In adult life, 25-44, the death-rate from Tubercular Disease is nearly three times as great in the Manchester Township, at ages 45-64 considerably over four times, and at ages above 65 nearly 12 times as great, as in North Manchester.

The death-rate in South Manchester from Tubercular Disease stands midway between.

We may safely affirm on the strength of these figures alone that the complex of conditions injurious to health is far more serious in the Manchester Township than in South Manchester, and far more serious in South Manchester than in North Manchester.

Diseases of the respiratory system also tell the same story, though in not quite so emphatic a fashion.

Death-rates in the Sanitary Districts of the City.

If we compare the death-rates in each of the Sanitary Districts given in Table 5 with the mean death-rates for the ten years 1891-1900 we obtain a good idea of the great advance made in the year 1903. We see that in the Central Districts and in North Manchester the death-rate is diminished by one-sixth, and in the Southern Division by one-seventh.

In the Manchester Township the reduction is greatest in St. George's district, then in Ancoats.

In North Manchester the reduction is greatest in Harpurhey, Bradford, Crumpsall, and Beswick; least in Clayton, Moston, Newton Heath, and Blackley.

In South Manchester the reduction is greatest in West Gorton, and then in Ardwick and Openshaw: least in Rusholme, Chorlton-upon-Medlock, and Hulme.

Indeed, the institution death-rates show very clearly that in the last two districts there is a decided increase in poverty.

Deducting, now, all institution death-rates, we find, what would scarcely be expected, that the Central District of the Manchester Township shows a lower death-rate than Ancoats or St. George's.

In North Manchester the districts showing the lowest death-rates are Cheetham, Crumpsall, Blackley, Harpurhey, and Moston, in all of which the home death-rate must be regarded as absolutely low. With the exception of Cheetham, these are outlying districts with a considerable fringe of country.

In South Manchester the lowest home death-rate is in Rusholme, also an outlying district.

The home death-rate is, however, comparatively low, also, in the Beswick district of North Manchester, and in the West Gorton and Chorlton-on-Medlock districts of South Manchester. The low death-rate of West Gorton is exceptional.

The highest home death-rates are in Ancoats, Hulme, and Bradford, and I would repeat here my opinion that a house to house inspection should be made of the Bradford district, so as to determine accurately the causes of its comparatively high mortality.

From Table H we find that the highest infantile mortality is, as usual, in the Manchester Township, but that South Manchester is not far behind.

The improvement in the general death-rate is not accompanied by a corresponding reduction in the infantile mortality.

Every one of the districts in the Manchester Township has a higher infantile death-rate than any other district.

In North Manchester the highest infantile mortality is in Clayton, Bradford, and Newton Heath.

Five out of the six districts comprising South Manchester have a high infantile mortality.

Table P gives a summary of the work done in the Sanitary Department, but, beyond indicating generally the large amount of routine work done, it affords no ground for special comment.

GENERAL STATISTICS,

With special reference to the Physical progress of the Community.

Much attention is at present being bestowed on the supposed physical degeneration of the race, owing, it is assumed, to aggregation in our large towns.

The Royal Commission on Physical Culture (Scotland), from the observations made by Dr. Leslie Mackenzie in Edinburgh and by Professor Matthew Hay in Aberdeen, arrived at the conclusion that in those towns the physical condition of the children gives ground for anxiety. They were of opinion that means should be found to feed children not receiving enough sustenance, but not at the public expense. They considered also that physical exercises should be varied according to the age of the children.

The results of the observations made on 600 school children in Edinburgh and in Aberdeen, respectively, are given by the Commission as follows :—

Percentage of children affected with—	Aberdeen	Edinburgh
Diseased glands	2·0	18·5
Nose and throat disease (often slight)	30·0	52·5
Lung Disease	1·8	3·0
Heart Disease	1·0	4·3
Bone Disease	2·7	3·0
Diseases of refraction of the eyes, interfering with vision	23·9	31·7
Diseases of the eyes and eyelids	12·2	15·5
Diseases of the ears, causing defective hearing.....	14·0	42·0

It should be mentioned that these children were selected so as to represent as nearly as possible average conditions.

The Report goes on: "If these ratios can be taken to apply to the whole population, there are in Edinburgh Board Schools 700 cases of unrecognised Phthisis and 450 in Aberdeen, 1,300 cases of unrecognised Heart Disease of a dangerous nature in Edinburgh and 250 in Aberdeen. Of lesser ailments, there are in the Edinburgh Schools 15,000 children and in Aberdeen 7,580 affected with Disease of the Throat of a nature in many cases to impede development. The Diseases of the Eye form no less serious an element. On the same supposition there would be, having diseases of refraction of the eye interfering with vision, in Aberdeen 3,872 and in Edinburgh 9,500."

Dr. Kerr states that of 20,000 children under the London School Board examined by oculists, 10 per cent. are so seriously affected that they will have defective vision all through school life.

While these examinations show the existence of very serious conditions in school children, they can in no way be taken as tokens of deterioration, but rather of indications as to how much there still remains for preventive administration to effect.

If we consider the immense advance that has been made in respect of Scarlet Fever, Enteric Fever, Smallpox, and Tuberculosis as the result of special attention, and in the death-rate of the young generally, we must conclude that the more serious affections, at all events, have always existed, and have formerly been allowed to escape attention.

On a review of all the facts which one is able to find, I am led to these conclusions:—

1. There has been a steady improvement in the health of school children for many years.

2. Education must be greatly retarded by the large proportion of children suffering from mental or physical defects unfitting them to learn.

3. It appears to me impossible to exercise sufficient supervision over the health of school children by medical examiners alone. On the other hand, we have an immense body of intelligent teachers, in constant contact with the children, who ought to be available for health work, and should be expected to see to the physical welfare of the children.

4. It has become necessary with the development of elementary education that teachers should receive a systematic course of practical instruction on classes of children from expert medical teachers so as to fit them for that duty.

Subjects in which such instruction would be required are :—

1. The detection of signs of illness or insufficient nutrition :—

   (*a*) At mental work.

   (*b*) During physical exercises.

2. The discrimination of illness and innutrition.

3. Determination of defective eyesight and hearing.

4. Detection of parasitic diseases.

5. The steps to be taken in connection with Measles, Whooping Cough, Scarlet Fever, and Diphtheria.

6. The practical steps to be taken in connection with illness and innutrition respectively.

7. The determination of mental defects.

Having the children constantly under their care, the teachers would arrive at fairly accurate conclusions, and would be able without excessive effort to overtake the work.

The report of their observations would be sent to the Medical Officer of the Education Authority, who would see that the children reported on were examined medically when requisite.

Only in the case of infectious diseases would teachers be expected to take prompt action, and here their examinations would, if properly carried out, be of great value. But in all cases in which children were found to be incapacitated from learning the same things as the other children, they would receive special attention or be separately dealt with.

It is by no means an easy matter to determine when mental or physical weakness is due to deficiency of food, and for this purpose, especially, careful training would be necessary.

But it is quite certain that a child not receiving sufficient nourishment must suffer in physique, or mind, or more probably in both.

The average child in an industrial school is of considerably less height and weight than the average child in an ordinary elementary school of the same age, and the latter is far below the standard of public schools. On the other hand, the improvement in physique is very marked when children are put on proper diet and have good physical training.

We may take it for granted that any improvement in the physique of school children will be accompanied by an improvement in their capacity for receiving mental and physical instruction.

We cannot measure the latter, but we can the former, and it is surely not too much to advocate that every child at an elementary school should be measured and weighed once a quarter, and a record kept of the age, height, and weight.

In this way we should get valuable information as to the effect on health of any particular course of physical instruction or method of teaching. Such information would be of especial value at present in comparing schools in which the feeding of the children was carefully supervised with those of a similar class in which no supervision is exercised.

But, in addition, particular children in a doubtful condition of health could be weighed more frequently, and the information thus obtained would be of the utmost value.

It is rapidly becoming the general opinion that no child should be instructed, and still less drilled, who does not receive the amount of nourishment sufficient to ensure normal growth.

The problem is, how to ensure adequate nourishment. It is felt, on the one hand, that parental responsibility must be maintained, and on the other that the children must be fed.

It would be by no means impossible, or even difficult, to provide the requisite machinery by which these views could be reconciled. But it might not be so easy to make it work successfully. The same trouble presents itself with all administrative problems.

Supposing, however, that the Education Authority provides the machinery and obtains the funds needed to ensure that every child at school is sufficiently fed, there still remains the difficulty of the years preceding school. Ignorance or neglect in the first four years of life produces mischiefs which are never entirely recovered from; and if the nation is to be maintained through its children, those of an early age must receive equal attention with those who are so fortunate as to reach school age.

For this also a new machinery is needed. We have been endeavouring to teach mothers how to feed their children through the agency of the Ladies' Public Health Society, and the District Registrars of the City have assisted in diffusing information on the subject. But what has already been done is but a very small matter in comparison of what is needed.

There is little doubt that the girl of to-day knows much less, on the average, about domestic economy and the management of children than did the average girl 50 years ago. There are now many openings for girls seeking employment, and the greater number prefer employments such as machining, typewriting, and cotton spinning, with freedom after the day's work, to the less laborious but more trying occupations of home.

Most girls engaged in industrial pursuits learn little or nothing about cooking, cleaning, nursing, and so forth—branches of work which, as valuable wage earners, they are excused from. Yet these girls are the mothers of the next generation, and nothing which they learn at school or at the factory is nearly so valuable to them and so necessary for the lives dependent on them as the housewife knowledge which has become disused.

If, however, they are to acquire such knowledge, the subject must be taken up by the Education Authority, and taught practically in the Elementary Schools. One knows how much is now being done in the Continuation Evening Classes, but I would express the opinion that the education now advocated is vital to the welfare of men, women, and children, and should occupy a compulsory and sufficient position.

It would comprise :—

1. Cooking. This is, I am informed, practically compulsory in Sheffield.

2. Sewing, mending, and washing.

3. How a house should be cleaned, and in what cleanliness essentially consists.

4. Practical instruction in the requisites of feeding, clothing, and tending infants ; in the food and clothing of children.

5. Instruction in food values, and in the economic arrangement of diets.

6. On the way to keep foods.

This would probably be an ample course for daily instruction extending over six months, though a year's training would be more useful.

Young mothers require increased nourishment during child-bearing or while suckling. No doubt, advice on this subject is often given by medical men, but more might be done to make the importance of health at these periods clear.

It is desirable also that the instruction given to boys should be such as to give them additional interests and occupations at home.

They might usefully learn a number of practical things, such as how to make shelves, mend walls, make boxes, make cages for provisions, mend clothes, put up swings, etc.

They should be taught elementary dietetics.

Both boys and girls should have instruction in the effects of alcohol, but not until about to leave school.

The Education Authority and the school teachers alone have sufficient power, and sufficient staff and funds, to deal successfully with the training of the future wives and mothers.

But, although the health of the population is susceptible of immense improvement, it does not follow that one should accept the statements which have been so confidently put forward in regard to physical degeneration.

There are several ways in which this question can be attacked.

1. The most satisfactory would be to compare the height and weight of school children of given ages now and formerly, and, if it were possible to obtain the facts, to make the same comparison for different classes of the population. Neither set of facts exist now in sufficient amount to yield reliable conclusions. But it may be possible to get the facts for the schools. There is little likelihood that they will be obtained for adults. It is only necessary to say that isolated groups of facts are no use for this purpose.

Such facts as do exist point to improvement.

2. Impressions and photographs must count for something. Photographs of poor school children taken 20 years ago, and of the same class of school children taken recently at the same school, are said to show marked improvement.

Photographs of the children in slums taken by Mr. Ellwood 15 years ago and recently undoubtedly show improvement.

The impression of teachers, I am informed by Mr. Wyatt, is that there is a marked improvement.

3. Dr. Ashby's impression is that rickets is less common than formerly, and Mr. Dewsnup, the Head Relieving Officer of the Manchester Board of Guardians, is decidedly of the same opinion. He considers, however, that deterioration is evident during the last two years of trade depression.

4. We cannot accept the statements of recruiting officers as evidence for or against, since the quality of recruits will vary greatly with the state of trade. Medical men and clergymen are about evenly balanced in their views as to improvements in the young or the reverse; while business men, on the whole, see an improvement in physique in the younger men.

There is a general consensus of opinion that women have improved in most respects, physically.

5. There are no general reliable data as to sickness, and we must, therefore, get what evidence we can from mortality statistics.

From the Annual Reports of the Registrar-General we obtain mean quinquennial death rates at groups of ages for England and Wales, so that we are able to judge what change has occurred in the mortality of infants, young children, school children, young people, young adults, people at the middle periods of life, and old persons, and this comparison is made every five years for a period of 60 years.

We thus find that at all the younger ages there has been a great reduction in mortality, occurring gradually, both in males and females, the reduction being least, of the younger ages, in childhood. The amount of the reduction, though not the manner of it, may be seen by excerpting the death-rates in 1841–45 and 1896–1900 for males and females.

MALES.—Deaths to 1,000 living.

Period	All Ages	0—	5—	10—	15—	20—	25—
1841-45	21.3	68.7	8.8	4.8	6.8	9.0	9.4
1896-1900	18.8	62.4	4.1	2.3	3.6	4.9	6.5

Period	35—	45—	55—	65—	75—	85 & up
1841-45	12.2	17.2	30.3	65.5	143.7	305.1
1896-1900	11.1	18.3	34.1	68.3	142.9	282.6

FEMALES.—Deaths to 1,000 living.

Period	All Ages	0—	5—	10—	15—	20—	25—
1841-45	20.1	58.6	8.6	5.2	7.7	8.6	9.9
1896-1900	16.5	52.7	4.2	2.4	3.3	4.1	5 6

FEMALES—*continued*

Period	35—	45—	55—	65—	75—	85 & up.
1841-45	12.2	15.1	27.2	59.1	138.8	288.6
1896-1900	9.1	14.3	27.4	58.4	126.8	258.5

Those who are interested in the subject may consult the Annual Reports of the Registrar-General for the complete figures. It will be seen that the reduction in the death-rate at all ages and at different ages is greater for females than males.

A marked drop in the death-rate at ages 0-5 occurs in 1881-85, while at the child-bearing ages a conspicuous drop occurs in the previous five years, 1876-80.

It is, perhaps, permissible to suppose that the improved circumstances of the people at the earlier period may have resulted first in an improvement in the physique of the adults, and, by consequence, in the health of the children born in the succeeding five years.

Is it allowable to draw from these premises the conclusion that there has been a great improvement in the health of young people, or must we think that all this improvement in the juvenile death-rate is the result of curative advance, and tends to the production of an enfeebled race?

Now there is no doubt that medical science and sanitary administration have effected much. Smallpox is not now able to expand into great pandemics, Typhoid Fever has greatly decreased, and Scarlet Fever has subsided into a minor disease. Factory legislation in towns has done much for the health of the young and of women. Surgery has made enormous strides, and medicine has rejoiced in many useful discoveries. Yet, surely, prosperity has done more. Food is cheap, wages are greatly increased, housing has much improved. Clothing is far better, and cheaper.

The facilities for travel have greatly improved, so that it is now comparatively easy to go from where work is scanty to where it is plentiful.

The improvement in health is not confined to places in which sanitary administration has been active, but extends all over the country.

It is very unlikely, on the face of it, that the great increase of purchasing power and purchasing means should be attended with a lowered physique, and we are, therefore, inclined to believe that the lowered mortality implies, as it should naturally do, that there is less sickness and greater resisting power.

How, then, are we to account for the increased death-rate at more advanced periods of life?

It will be noted that this increase affects women to a much less degree than men, and, in fact, scarcely at all. Now a death-rate which is modified especially in favour of children and women may almost be taken to denote prosperity, since it shows the lifting of the burden of labour from both.

As regards the increased death-rate in men at the more advanced ages these explanations might be put forth :—

1. It might be due to the transition into the higher ages of a population, on the whole, physically less fit than was formerly the case.

2. Town life wears men out faster than country life, and an increasing population lives in the towns.

3. The older men in their childhood passed through the severe ordeal of 1841-60 and have never entirely recovered.

4. The habits of adults may now be worse than they formerly were.

5. Older workpeople may now be more readily discarded than they were at a former period.

6. Owing to their increasing numbers the older nomad population may now be more crowded, and thus more subject to disease than formerly.

So heavy is the death-rate in this last class that a decided influence on the death-rate at more advanced ages might thus easily be exerted.

It is difficult to apportion these factors, but, no doubt, all contribute.

It is deserving of attention that an improvement at the more advanced ages was noticeable in the five years 1896-1900.

What was the history of Manchester at the corresponding ages over the last 50 years?

Table A shows the death-rate at different periods of life for the years 1851-90 in the three Unions of Manchester, Chorlton, and Prestwich, the figures for the ten years 1891-1900 being for the City of Manchester as now constituted. These figures may be taken as fairly comparable.

TABLE A.

Death-rates in Age Groups in Manchester.

Years	All ages	Under 5	5—	10—	15—	20—	25—
1851-1860	28·59	105·95	11·61	5·18	7·72	8·75	11·28
1861-1870	29·44	100·87	11·48	5·44	7·61	9·21	12·03
1871-1880	27·06	86·90	8·97	4·45	6·22	8·42	11·70
1881-1890	24·15	77·52	7·50	3·67	5·12	6·47	10·19
1891-1900	23·27	82·11	5·62	2·93	4·39	5·33	8·36

Years	35—	45—	55—	65—	75—	85—
1851-1860	16·62	26·46	44·82	86·60	172·30	344·75
1861-1870	18·31	27·80	49·82	94·64	181·48	294·05
1871.1880	18·22	28·29	49·98	95·64	180·51	
1881-1890	17·33	27·30	49·39	93·33	176·39	
1891.1900	16·40	26·87	49·27	94·96	181·06	306·36

TABLE B

Shows Corresponding Death-rates in the Manchester Township in Age Groups.

Years	All ages.	Under 5	5—	15—	25—	45—	65—
*1851-1860	31·48	117·24	9·22	8·98	15·24	36·08	116·16
*1861-1870	32·80	111·88	9·63	9·44	16·96	39·99	122·48
*1871-1873	31·46	103·82	7·81	9·01	17·07	39·93	113·73
1874-1880	32·16	103·52	7·84	8·72	18·59	44·93	126·34
1881-1890	31·73	96·69	6·32	7·81	19·66	49·43	123·18
1891-1900	30·10	104·33	5·25	5·66	16·67	46·48	142·47

* Up to the end of 1873 the Prestwich Union formed a part of the Manchester Union. These figures are, therefore, for the two Unions combined.

It will be seen that for Greater Manchester the figures are in general correspondence with those of the whole country, although in excess at almost every age.

For the Manchester Township, however, they are very different. The most conspicuous feature here is that at school ages and at the ages 15–24 the death-rates are much lower than they were 55 years earlier throughout

the whole country. At later ages they have increased. This is scarcely to be wondered at, considering how differently constituted the central districts of the city are now from what they then were.

But what is matter for great congratulation is the immense improvement which has taken place in the lot of even the poorest children, the effect of which on the death-rate has more than counterbalanced the effect of the general change in the character of the population.

It can scarcely be doubted that, with all their faults as regards ventilation and playgrounds, and in spite of their effect in causing the propagation of some diseases, no small share in this improvement must be ascribed to the influence exerted by the elementary schools. There is much still to be done, but the results already attained form the strongest incentive to fresh effort.

The general improvement in the death-rate of Greater Manchester deserves special attention.

In the improvement manifest in the decennia 1881–90 and 1891–1900 a number of factors have co-operated. These may be enumerated as follows :—

Improved sanitary administration.

Protection of food, especially of milk, under the Sale of Food and Drugs Acts.

During the last decennium improved building bye-laws have given dry houses and more air space.

The older and more insanitary portions of the City are gradually disappearing.

The operations of the Sanitary Committee in the closing of unhealthy dwellings and in the reconstruction of houses and areas.

The methods of storing and removing excreta have undergone a gradual improvement.

Great advances have taken place in drainage and plumbing.

Elementary education has effected a great improvement.

An excellent water supply has been provided.

The Factory and Workshops Acts have taken a great load off women and children.

The Alkali Acts have helped to improve the atmosphere.

Yet improvement was abruptly manifested in the decennium 1871-80, and most of these factors are of subsequent date. It is probable that the great prosperity of that period would re-act most rapidly in Manchester, and it is

further probable that the great improvement in the health of young people in those years was due mainly to the enjoyment of more and better food and better clothing.

In collecting evidence as to the condition of the population, I addressed circulars to a large number of gentlemen known to have an intimate acquaintance with portions of the population, many of whom favoured me with their views in an extended form. It is not possible to give their opinions separately here, but a summary of the influences which they considered to be acting unfavourably on the population may be of interest, and certainly has great value, being founded on statements of opinion from 45 medical men, 16 clergymen, and 22 business men, all having a long acquaintance with the City.

Diet is most emphasised, and the points animadverted on are the use of cooked foods, tinned meats, condensed milks, bread and tea in excess; absence of wholesome food, such as porridge; defects in the milk supply; want of economy. In 45 instances the opinion is expressed that the diet is deficient.

With much of this I do not agree, but I do agree with the strictures on the want of economy, the ignorance of diet, and the deficiency of diet, often due to the use of articles of diet beyond the means of the purchaser, if taken in adequate amount.

In 39 instances drinking is emphasised as a cause of deterioration, and several state that drinking amongst women has increased. One medical man states that men earning 20s. to 25s. per week often spend from 8s. to 12s. in drink. If he were to apply his remarks to a lower stratum of the population he might go further.

In only five instances is gambling emphasised, though there is reason to believe that much harm is effected by this means.

In five instances other vices are insisted upon, which it appears to me can only be dealt with adequately by parents and the medical attendants.

In nine instances deficiency of games and exercises are singled out, while one medical man considers "Sandowism" injurious.

In five instances smoking by the young is specially mentioned.

In seven instances extravagance and indulgence in unnecessary pleasures and late hours are censured. This censure may be taken to apply chiefly to young adults, both married and unmarried.

In only three instances is dirt commented upon.

These figures may be taken to represent roughly the relative degrees of mportance attached by those acquainted with the facts to the different factors acting injuriously on the Manchester population.

I believe they represent fairly well the order in which these factors should stand, except that, in all probability, the deficiency in games and exercises, having regard to the physical ability of the children concerned, is less than these figures would indicate.

On poverty as productive of a high death-rate.

When one comes to reflect on the various causes productive of ill-health, and of that more intense form of ill-health which ends in death, the influence of poverty, and more particularly of unsettled poverty, looms larger and larger. There are a great many who die virtually of starvation year by year. There is little doubt that the vagrant classes are at present increasing. They are the terror of the country in summer, and the disease carriers of the town in winter. No one who has seen much of the inhabitants of the lower class of common lodging-houses can help considering whether it is inevitable that great numbers of men should sink so low. Many of them can and do work, perhaps earn 25s. to 30s. a week. Their lodging costs them 2s. a week, their food perhaps 5s. What becomes of the rest? Others, again, more thrifty of health and effort, work a few hours in the morning, and are amply supplied. These men, unshackled by family cares and expenses, keep down the price of labour and the standard of life.

The proportion which rises from such surroundings—squalid, malodorous, destructive—is probably trifling.

The corresponding houses for women cannot even be described in similar terms.

The condition of these people has evoked the most admirable efforts on the part of charitable persons, who give both work and money in the effort to help them without intensifying the evil. It is no light task, since, as the more enlightened humanitarians feel, it is not easy to hold out a helping hand without attracting an influx of miserable persons into the centre of charity. Certain it is that, whether as the cause or the effect of charity, those centres of population in which most is done for the vagrant classes are most afflicted by their numbers, habits, and movements.

The Germans have endeavoured to solve the problem by the establishment of labour colonies, and it is, undoubtedly, an object of prime importance, especially as regards the dissemination of disease, that vagrants should be established in definite fixed locations, and not be allowed to wander over the country.

It is an even more important question whether effectual steps cannot be taken to reach and destroy the roots which send up such plants.

The excellent poor-law schools in this district are doing good work in this direction, and our chief hope must lie in the kind and quality of the instruction imparted to children generally.

Vagrancy takes its rise in casual labour and drink, and the conditions of casual labour foster drinking. It may almost be stated as an axiom that every occupation in which casual labour, or even irregular labour, is a feature, will be attended with an undue amount of drinking. Whether anything can be done to diminish the evils of casual labour I am not prepared to say definitely.

It has already been mentioned that the married labourer with a family is subjected to a severe competition from the inhabitants of common lodging-houses.

How far it is possible to give preference to married men of settled habits I cannot tell, but one would imagine that the employment of casual labour might usefully be organised in this direction. The suggestion is that, with a little trouble, the employers of casual labour could exercise great pressure towards social betterment, not confined to the one class whom I have mentioned.

The extreme misery does not fall on the vagrant or denizen of the common lodging-house. These suffer nothing by comparison with the poorest families, and the physical and mental deterioration which the children undergo furnishes another spring of vagrancy and shiftlessness, perhaps the most abundant.

There is but one way to cope with this social danger. The children must be educated, and well educated, in such a manner as will enable them to meet with confidence the difficulties and temptations of life. If this object is to be achieved the Education Authority must see that these children are adequately fed, so that they may grow normally, and so that the enormous development and laying out of brain protoplasm necessary for educational purposes may be furnished.

Labour colonies may meet pressing exigencies, but far more is required for the general uplifting of the population, and we ought not to grudge money to the Educational Authority, especially the money required for the needs of poor children.

It is, perhaps, well to furnish some particulars in illustration of the effects of poverty on the death-rate in Manchester. One says advisedly in Manchester. Deep as is the poverty in rural districts, the dweller in the country has the sunlight, green fields, fresh air, pleasant sights and sounds which

refresh the brain, and send through every nerve stimulating impulses. There is room to move freely, and the constant encroachments on health from invasion by one germ or another are escaped. Where they are not escaped, they are encountered with greater vigour and success. The food is more completely digested, and goes further.

There is not the constant invitation to enter one or another public-house which exists in the town. Wide as is the charity of the town, both from rich and poor, it is probable that it overtakes the needs of the poorest to a much less extent than does that of the country side.

Hence the following figures are to be taken as having reference purely to the town.

The indices of poverty are taken to be the death-rates of those inhabitants who end their life in the Union Hospitals and in other institutions, the former indicating a deeper degree of poverty than the latter. It is quite true that there may be much sickness without death. But, speaking quantitatively, death corresponds more nearly to poverty than does sickness.

I give first the figures for ten years, showing the total death-rates in the Manchester Township, in North Manchester, and in South Manchester, which inform us that the Manchester Township is much poorer than South Manchester, and South Manchester than North Manchester.

Populations at the Census, 1901	Manchester Township ...	135,555
	North Manchester	162,132
	South Manchester	247,605
	City	545,292

Average Annual Death-rates (corrected for the Census figures, 1891 and 1901) for 1891–1900 amongst persons dying at home, in Union Hospitals, and in other Institutions; also the total death-rates for the City and its three main divisions :—

	Home death-rate	Workhouse death-rate	Hospital death-rate	All death-rate
City	18·69	2·96	1·62	23·27
Manchester Township ...	21·45	6·09	2·51	30·05
Northern	16·64	0·81	1·26	18·71
Southern	18·26	2·36	1·30	21·92

I now give the death-rates at different periods of life for the same ten years in the same divisions of the City, the deaths including those which occur in the Union and in other Hospitals from all causes, and also from Phthisis :—

ALL CAUSES.

Division	All Ages	0–5	5–15	15–25	25–45	45–65	65 and upwards
Manchester Township...	30·05	104·72	5·26	5·68	16·69	45·88	127·89
Northern	18·71	66·24	3·80	4·37	8·74	27·32	101·22
Southern	21·92	78·46	4·03	4·67	10·65	32·23	112·45
City	23·27	82·19	4·30	4·86	11·77	34·94	113·87

PHTHISIS.

Division	All Ages	0-5	5–15	15–25	25–45	45–65	65 and upwards
Manchester Township...	3·21	0·47	0·53	1·84	5·68	6·22	3·85
Northern	1·29	0·23	0·26	1·40	2·21	1·99	0·76
Southern	1·87	0·47	0·35	1·54	3·12	3·17	1·41
City	2·08	0·40	0·38	1·58	3·57	3·75	1·91

It is necessary to take the death-rates at different ages, since the death-rate in adults living in common lodging-houses and in other similar houses being enormous, it might be supposed that the differences in the total death-rates are determined by this cause. Phthisis is selected as a disease which eminently reflects the influence of poverty, being determined by overcrowding, physical privation, anxiety, want of rest, and all the factors which are dependent on poverty.

We thus see that profound differences in the total death-rates are manifest at every age, though they are greatest in childhood and in adult life.

The same remark applies to Phthisis, the differences being, however, greater. In childhood and at ages 25-44 the death-rate from Phthisis is in the Manchester Township more than twice that in North Manchester, at ages 45-64 more than thrice, at ages above 65 more than five times.

Similar though much smaller differences at nearly every period of life are manifest in respect of Measles, Whooping Cough, Diarrhœa, Nervous Diseases, Diseases of the Circulation, Pneumonia, and other Respiratory Diseases.

The largest differences after Phthisis come under Pneumonia and other Respiratory Diseases.

We are, thus, reminded of the great importance of seeing that poor children get, besides good food, fresh air and exercise. It is also seen that the removal of all filth from the neighbourhood of dwellings is an object of the first magnitude.

It is to be remembered that there is a preponderance of occupations directly injurious to the lungs, as well as of effluvia and smoke, in North Manchester, which has by far the lowest death-rate from Chest Disease.

That does not imply that these influences do not act injuriously, but it does show that there are still more potent factors at work.

This subject is considered more fully by Alderman McDougall in his contribution to the British Medical Association, published in the "British Medical Journal," 1902.

It has appeared to me that we ought to have a more intimate knowledge of the conditions under which the poorest people are living. It will be remembered that by his investigation into the conditions of life in the City of York, Mr. Rowntree established that over one-tenth of the population were in a condition which he characterises as primary poverty, that is to say, were unable to procure the necessities of existence, assuming them to be normal individuals; while, from one cause or another, about 30 per cent. were in a condition of poverty.

It is necessary to realise what primary poverty implies. If a child has not enough to eat he does not grow, becomes stunted in fact, and an effort is made by nature to save his life in that way. Unfortunately his mind also is often stunted and warped.

If a man has not enough to eat he cannot do his work, since work has its equivalent in a certain quantity of food. To save his life, therefore, he must shirk work. The badly-fed man is inefficient of necessity. If he cannot shirk work sufficiently, so that his food provides for the internal work of his organs + animal heat + the work he does, he takes disease and dies. It is a process very costly to the community, though worse evils might attend the wrong remedy.

If the woman is insufficiently fed she produces miserable offspring, which usually get no chance to recover ground after birth. Beyond the necessity of seeing that children are adequately fed, I am not prepared at present to make any positive suggestions of a social character. Yet this is part of Public Health.

In determining the question whether families could be sufficiently fed on the amount of money coming in, Mr. Rowntree carefully deducted all other expenditure besides food, and then determined how much money there remained, as well as how much was necessary.

To get at the latter amount he adopted Atwater's estimate of the amount of proteid, fat, and starchy food required for an adult man weighing 11 stone and doing moderate work.

He also adopted his estimate of the proportion of the same diet required by persons of different ages.

Taking the amount required by the adult man as one, he estimates that a woman on the average requires .... 0·9

A boy 14 to 16	0·8
A girl „ „	0·7
A child 10 to 13	0·6
„ 6 to 9	0·5
„ 3 to 5	0·4
„ under 2	0·3

If, now, we know the ages of different members of the family, and the amount which is to be expended on the man's diet we can say how much is required for the week's diet, thus—

A family consists of a man, woman, a boy aged 9, and a girl ages 5, and the man is to cost 8d. per day, how much will the family cost?

$$\begin{aligned} \text{Daily diet} &= 8\text{d.}\ (1 + \cdot9 + \cdot5 + \cdot4) \\ &= 8\text{d.}\ (2\cdot8) = 22\cdot4\text{d.} = 1\text{s.}\ 10\cdot4\text{d.} \\ \text{Weekly diet} &= 13\text{s.}\ 0\cdot8\text{d.} \end{aligned}$$

Now the daily diet required by an adult man weighing 11 stone, and doing moderate work, should, according to Atwater, contain proteid 125 grammes, fat 125 grammes, carbohydrate 450 grammes. We have tables showing the quantity of proteid, fat, and carbohydrate in different articles of food, so that we can combine these to give the necessary amounts. I have also obtained the current prices of food in the poorest districts, and have constructed dietaries showing how the requisite constituents may be obtained as cheaply as possible.

We find that it is possible to get these for as little as $3\frac{3}{4}$d., though, making allowance for the necessity of variety, it is probably that 5d. is the smallest possible sum on which a man could live, and it is, I think, certain that in the absence of a knowledge of the best choice of food, in most families, 7d. is the smallest amount on which an adequate diet could be obtained.

I have, then, had an enquiry made into the circumstances of a number of families, such as they usually visit, by the Health Visitors of the Ladies' Public Health Society during the latter part of 1903, and I have calculated out in the manner described above on what price of diet per man the money available is to be expended.

I find that out of 76 families 7 had means which would not extend to a diet of $3\frac{3}{4}$d. per man, while 46 could not afford 7d. per man. Taking into account 17 instances in which from the statements of the mode of expenditure it seemed probable that economy was observed, I calculate that 29 families must have been suffering from actual deficiency of food, or more than one-third.

I also had an enquiry made by Sanitary Inspectors in three of the very poorest districts in the City—in Deansgate, Angel Meadow, and Ancoats...and as these cover conditions of housing and occupation as well as diet, I give the analysis of the Inspectors' reports somewhat more fully.

District No. 1.—Deansgate.—Inspector Lord.

No. of families investigated, 46.

Occupations pursued.—The persons working numbered—males 54, females 21. Of the 54 males, 4 were errand boys or nippers, 3 carters, 3 hookers, 12 labourers, 6 porters, 5 hawkers. Of the 21 females, 7 were hawkers, 4 charwomen, 3 servants, 3 cotton spinners.

Housing.—In statements regarding housing one-roomed occupations are almost invariably furnished apartments ; two-roomed occupations and upwards are separate houses.

The tenements (houses) may be classified thus :—

Number of rooms per tenement	1	2	3	4	5	6	Total
Number of tenements	13	15	1	14	2	1	46
Number overcrowded	8	4	1	0	0	0	13

The Registrar-General's estimate of overcrowding is here taken, viz., over two persons per room. Overcrowding is confined to the one, two, and three roomed tenements.

Of these 46 dwellings, in 34 insanitary conditions were found, largely disrepair.

Available diet.—Eleven of the 46 families were unable to procure a diet at the rate of 3¾d. per man, and 22 were unable to find a diet equal to 7d., as shown thus :—

Number of rooms.....	1	2	3	4	5	6	Total
Unable to procure a diet at the rate of 3¾d.	2	5	0	4	0	0	11
Unable to procure a diet equal to 7d.	4	10	1	7	0	0	22
Total tenements	13	15	1	14	2	1	46

In this district the families occupying one room were less pinched for food than those occupying two, three, and four rooms.

The size of the family in relation to diet is of considerable interest.

The facts may be shown thus :—

No. of persons in a family	1	2	3	4	5	6	7	8	9	Total
Number of families.....	1	12	9	8	5	4	1	4	2	46
No of families unable to provide at the rate of 3¾d.	1	2	2	3	1	0	1	1	0	11
Unable to provide at the rate of 7d.	1	3	5	4	2	2	1	3	2	23
Average adult diet in pence	3d.	6½d.	5¾d.	5¾d.	6d.	6d.	2¾d.	4¾d.	5¾d.	

These figures show that in this district, if the starvation diet (3¾d.) is taken, the smaller families suffered most; but if the limiting diet be taken at 7d., which is probably more correct for most families, the larger families suffered most.

The following table shows the rents said to be paid :—

Number of Rooms	1	2	3	4	5	6
Number of tenements	13	15	1	14	2	1
Amount of rents in tenements of different sizes—average	s. d. 4 7	s. d. 3 11½	s. d. 4 6	s. d. 4 5¼	s. d. 6 0	s. d. 12 0
Rent not regularly paid	1	4	0	5	0	0

The one-roomed tenements are let 'furnished.' Hence the higher rents.

The analysis of the reasons given for deficient food or overcrowding appears so deserving of consideration that I give it in full for this district only. I give also the analysis showing the sickness present in different families.

In the other districts there appears to have been less sickness.

TABLE 7.—SPECIAL REASONS FOR POOR DIET OR OVERCROWDING.

Number of Family	Number of Rooms	Diet	Reasons
8	4	2d.	Accident to father, two sons out of work (11, Irwell Court).
4	4	3½d.	Two workers (earnings, 16s. ?).
7	2	5d.	£1 to 25s. earnings. Rent 4s. 6d.
9	2 +	5½d.	38s. (8s. spent on drink?) (4, Irwell Court).
9	3 +	6d.	32s. 6d. (23s. 6d. available for food?) (4, Back Quay Street).
2	1	2d.	Man a cripple, wife has diseased leg.
3	2	3d.	Hawker, has two lodgers (husband dead).
3	2	2¼d.	Two boys, one out of work, mother weak, father dead.
5	2 L.H.	1½d.	Man has Phthisis, mother underfed.
4	2	4½d.	Mother weak.
2	1 L.H.	8d.	3s., spent on drink.
4	4	2½d.	One daughter delicate, father dead, son-in-law a lodger.
2	2	1d.	Charwoman at 66, sole support, husband dead.
3	1 L.H.	1½d.	Father (fitter) out of work, wife deputy C.L.H., son errand boy, both said to earn 8s. 6d. a week.
5	1 L.H.	8 +	Rent 6s. a week.
5	2 L.H.	4½d.	? ? Earnings £1 a week. Rent 9s.
4	1 L.H.	8 +	Husband lost a leg, said to earn £1 on odd jobs.
6	1 L.H.	4d.	Baby is wasting, dock labourer, earns 15s.; 5s. rent.
4	2	3½d.	Father dead, daughter a servant.

TABLE 8.—SHOWING THE CONDITIONS AS REGARDS ILLNESS IN THE ABOVE 46 FAMILIES.

Number of Family	Number of Rooms	Diet Scale	Illness, etc.
8	4	2d.	Family appear weak.
4	4	3½d.	
4	2	3¾d.	Appear underfed.
7	4	2¾d.	Child has died with Bronchitis and Rickets.
3	1	3¾d.	Wife appears underfed.
2	2	8d.	Wife has weak chest.
3	2	6½d.	Mother a cripple, from fall.
3	4	8d.	Baby has had convulsions.
4	2	8d.	Man has Rheumatism.
4	2	7½d.	Wife delicate.
2	1	2d.	Man and wife Tuberculous.
3	4	7½d.	Man has Bronchitis; woman Indigestion.
2	2	8d.	Wife delicate.
3	2	2¼d.	Woman has Bronchitis.
5	2	1½d.	Father Tuberculous; child died of waste.
4	2	4½d.	Mother has Bronchitis.
4	4	2½d.	Daughter, aged 36, delicate.
6	1	8d.	Children appear Scrofulous.
2	1	8d.	Wife delicate.
5	1	8d.	Wife narrow-chested, probably Tuberculous.
2	1	7d.	Wife has internal complaint.
6	1	4d.	Baby wasting.
2	1	8d.	Wife delicate—internal complaint.

DISTRICT NO. 2.—ANGEL MEADOW.—INSPECTOR PRIESTLEY.

No. of families investigated, 42.

In occupation—males, 49; females, 29. Of the 49 males, 16 were labourers, 9 porters, and 5 hawkers. Of the 29 females 4 were charwomen and 4 were hawkers.

The tenements, classified as above, show :—

No. of rooms to tenement	1	2	3	4	5	6	Total
No. of tenements	15	20	3	3	0	1	42
No. overcrowded	3	2	0	0	0	0	5

Here, also, it is the one and two roomed tenements that are overcrowded. Insanitary conditions were noted in 37 out of the 42 dwellings.

Available diet.—Of the 42, 11 were unable to provide a diet at the rate of $3\frac{3}{4}$d. per day per adult, while 26 were unable to provide a diet at the rate of 7d., classed thus :—

No. of rooms	1	2	3	4	5	6	Total
Unable to procure a diet at the rate of $3\frac{3}{4}$d.	4	7	0	0	0	0	11
Unable to obtain at the rate of 7d...	5	16	3	1	0	1	26
Total No. of tenements	15	20	3	3	0	1	42

The families occupying one room were here also less pinched for food than those occupying two rooms, and, if the limit of 7d. be taken, than those occupying a larger number of rooms.

Size of the family in relation to diet.

No. of persons in a family ...	1	2	3	4	5	6	7	Total
No. of families...	1	13	8	7	7	5	1	42
No. of families unable to provide at the rate of $3\frac{3}{4}$d. ...	0	1	3	2	2	3	0	11
Unable to provide at the rate of 7d.	0	3	5	6	7	5	0	26
Average adult diet in pence ...	8	7	$5\frac{1}{4}$	$4\frac{3}{4}$	$4\frac{1}{4}$	3	$7\frac{3}{4}$	

Here there is no doubt that the larger families are most pinched in food.

Rents said to be paid.

No. of rooms	1	2	3	4	5	6	Total
Rents for tenements, average	4/4	3/9	6/7	7/10½	...	6/4	...
No. of tenements	15	20	3	3	0	1	42

DISTRICT NO 3.—ANCOATS.—INSPECTOR ANDERSON.

No. of families, 48.

In occupation, 87. Males, 53, of whom 16 were labourers, 5 hawkers, 3 glass workers, 6 porters. Females, 34, of whom 13 were charwomen, 4 waste sorters, 3 hawkers, and 4 machinists, seamstresses, or tailoresses.

Classification of tenements.

No. of rooms per tenement, with proportion overcrowded.					
No. of rooms	1	2	3	4	Total
No. of tenements	6	32	0	10	48
No. overcrowded	2	4	0	0	6

Again, only the one and two roomed tenements are overcrowded. Insanitary conditions, mostly in respect of ventilation, were noted in 32 of these dwellings, of which the majority were back to back houses.

Available Diet.

Of the 48 families, 10 were unable to provide a diet at the rate of 3¾d., and 27 were unable to provide a diet at the rate of 7d. Classified thus :—

No. of rooms	1	2	3	4	Total
No. of tenements	6	32	0	10	48
Unable to provide diet = 3¾d.	1	7	...	2	10
Unable to provide diet = 7d.	2	21	...	4	27

Here, also, the families occupying one-roomed tenements are least pinched in respect of diet.

Size of the family in relation to diet.

No. of persons in a family ...	1	2	3	4	5	6	7	8	Total
No. families	2	12	10	13	5	3	1	2	48
No. unable to provide = $3\frac{3}{4}$d..	1	3	1	2	2	0	0	1	10
No. unable to provide = 7d...	1	5	5	7	3	3	1	2	27
Average available diet in pence	5·5	5·9	6·3	5·7	5·1	5·5	6	$4\frac{1}{2}$	—

Again the larger families are seen to be most pinched in respect of diet.

Rents said to be paid.

No. of rooms	1	2	3	4	Total
No. of tenements	6	32	0	10	48
Average rents	5/3	3/4	0	4/$5\frac{1}{2}$	—

These districts have, then, this in common. In a high proportion of instances there is not enough food to go round.

Overcrowding is practically confined to one and two roomed tenements, and is considerably the worst in one-roomed tenements.

Families living in one-roomed tenements are less pinched for food than those occupying a larger number of rooms—why it is not so easy to see, since they pay higher rents.

Large families on the whole are most insufficiently fed.

The families occupying these very poor districts are of the labouring class.

It is difficult to present a picture by means of a few figures. But these suffice to show the terrible amount of privation existing amongst the very poorest people at the time the inquiry was made,

INFECTIOUS DISEASES.

The diseases included in the Infectious Disease (Notification) Acts, 1889 and 1899, are as follows: Smallpox, Scarlet Fever, Diphtheria, Membranous Croup, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Continued Fever, Puerperal Fever, Erysipelas, and Asiatic Cholera. The following cases were notified in 1903 and in the ten previous years, and the year 1903 is compared with the average of the previous ten years :—

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	Aver'ge for 10 Years	1903
Smallpox	607	282	51	1	...	...	2	3	1	27	97	422
Scarlet Fever ...	2,031	2,230	2,302	2,389	1,790	897	1,467	2,507	2,692	2,282	2,059	2,012
Diphtheria..... Memb. Croup	622	512	402	239	150	196	248	337	457	422	359	620
Typhus Fever ...	1	...	...	1	2	...	3	*5	39	...	5	...
Enteric Fever ...	618	460	493	513	503	642	381	378	359	378	473	387
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Fever	93	51	33	25	49	44	35	49	55	47	48	30
Erysipelas	...	...	...	...	...	...	...	177	318	253	249	291
	3,972	3,535	3,281	3,168	2,494	1,779	2,136	3,456	3,921	3,409	3,290	3,762

* There were a number of cases overlooked, and not notified, which were traced by the Medical Officer of Health after the patients had recovered.

The number of deaths for eleven years from the more common diseases is shown in the following table, 1903 being compared with the average :—

From	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	Aver'ge for 10 Years	1903
Measles	293	222	505	567	628	271	699	254	292	242	397	345
Scarlet Fever ...	140	116	173	198	124	65	46	105	127	146	124	97
Diphtheria..... Memb. Croup	182	149	113	83	46	51	85	101	133	123	107	136
Enteric Fever ...	127	91	95	118	95	120	73	75	75	66	94	93
Smallpox	49	21	2	...	...	...	...	...	...	...	7	24
Influenza	120	45	194	53	107	64	219	239	99	80	122	62
Whooping Cough	240	286	250	359	299	170	227	371	224	242	267	213
	1,151	930	1,332	1,378	1,299	741	1,349	1,145	950	899	1,118	970

SMALLPOX.

I beg to submit a report on the prevalence and spread of Smallpox in the the City during 1903, and also a report on the cases treated in Clayton Vale Hospital during the year.

The epidemic of Smallpox, which first attained serious dimensions in December, 1902, became more marked in January and February, 1903, and continued with little abatement until June, after which it gradually declined until on September 28th the last patient was discharged from hospital. After an interval of two days, however, another case was admitted from West Gorton. This marked the beginning of a rather serious recrudescence of the disease, chiefly affecting that district.

During the earlier part of January the affected area was chiefly the Central District, especially in the neighbourhood of Deansgate, with an occasional case of the tramp class from common lodging-houses in Angel Meadow. The cases in the Deansgate district were due almost entirely to an overlooked case in a baby in Eltoft Street, admitted into hospital in December, 1902. The chief part of the epidemic, however, can be traced to a case which occurred in December, 1902, in a common lodging-house in Shepley Street, London Road. This was followed by another case in the same lodging-house on January 12th, and two others on January 16th. In the beginning of February an extensive outbreak occurred in a common lodging-house in Grosvenor Street, Chorlton-upon-Medlock. This was traced to a man (J—— W——) who had previously lived in the affected lodging-house in Shepley Street, and had contracted the disease there. He left this lodging-house about the end of the first week of January and went to live in the lodging-house in Grosvenor Street. Here he developed a slight overlooked attack, and infected a number of the lodgers there. He also went to work, and infected his master and several of his fellow-workers. His wife, niece, and brother were also amongst his victims. This case will be more fully discussed when overlooked cases are being considered, but here it may be mentioned that 21 cases could be traced to him directly, while indirectly he was the cause of an outbreak in another lodging-house in Grosvenor Street, and also of outbreaks in other lodging-houses. During the month of January and the greater part of February the disease was chiefly confined to tramps and inmates of common lodging-houses, together with an outbreak in Crumpsall Workhouse; but towards the end of February the disease got a firmer hold of the general population, so that cases in private houses began to be more frequently notified, the source of infection in most of these cases, however, being successfully traced.

Common lodging-house cases played a large part in the outbreak until the end of April, after which comparatively few cases occurred in these houses.

Up to the middle of April cases occurring in private houses could in nearly every instance be traced to a known source, but at this time a fair proportion of the cases began to occur in private houses the sources of which were not at all clear. This continued up to the end of the year.

The total number of cases occurring in Manchester during the twelve months was 422. A general idea of the progress of the disease may be got from the following table, where the cases are classified in weeks according to the dates of onset :—

TABLE I.—SMALLPOX ATTACKS IN WEEKS REPORTED IN 1903, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 3	4	April 4	19	July 4	6	Oct. 3	2
,, 10	16	,, 11	7	,, 11	2	,, 10	6
,, 17	8	,, 18	9	,, 18	4	,, 17	...
,, 24	17	,, 25	7	,, 25	2	,, 24	6
,, 31	36	May 2	8	Aug. 1	3	,, 31	3
Feb. 7	25	,, 9	15	,, 8	1	Nov. 7	1
,, 14	28	,, 16	4	,, 15	...	,, 14	...
,, 21	23	,, 23	24	,, 22	1	,, 21	1
,, 28	13	,, 30	2	,, 29	1	,, 28	2
Mch. 7	26	June 6	8	Sept. 5	2	Dec. 5	2
,, 14	12	,, 13	7	,, 12	...	,, 12	4
,, 21	10	,, 20	9	,, 19	...	,, 19	2
,, 28	19	,, 27	9	,, 26	3	,, 26	3
Total...	237	Total...	128	Total...	25	Total...	32

City Total 422

From the above table it will be seen that the disease was by far more prevalent during the first quarter than during the remainder of the year. This was the period of prevalence of the disease amongst tramps and the inmates of common lodging-houses, where it is extremely difficult to control. During this quarter, 86 cases occurred in common lodging-houses, and four tramps suffering from the disease were found in the casual wards.

There was a considerable drop in the number of cases during the second quarter, when 128 cases had their onset. The number of cases found in common lodging-houses in this quarter was 10, and there were no infected tramps found in the casual wards.

During the third and fourth quarters there was a very marked decrease in the number of cases, all of which occurred in private houses, with the exception that two tramps were found suffering from Smallpox during the third quarter.

The number of cases remained fairly constant, week by week, up to April 4th, after which there was a sudden drop, to be followed by a second drop in the week ending July 11th. During the period between April 4th and July 11th there was a sudden increase in the number of cases in the week ending May 9th, in which 15 cases had their onset; and another greater increase in the week ending May 23rd, when 24 cases sickened. The increase in the week ending May 9th was due to several overlooked cases in private houses in addition to several imported cases, while that in the second week in question was due to an outbreak amongst the inmates of one of the workhouses. The cases occurring during the recrudescence of the disease in October and November were mostly, if not entirely, due to a number of cases of Smallpox in a house in West Gorton which were treated as Chicken-pox. In December a large works in Stretford became affected with the disease, and five men who worked there, but lived in Manchester, were attacked.

The earlier cases were almost exclusively confined to the more Central districts of the City, but all the districts ultimately shared in the epidemic.

The following table gives the number of cases in each district, the attack rate per 1000, and the case fatality per cent. :—

TABLE II.

DISTRICTS	ATTACKS	ATTACK RATE PER 10000	CASE FATALITY PER CENT.
Ancoats	61	1·37	3·3
Central	64	2·24	6·2
St. George's	51	0·86	9·8
Cheetham	5	0·13	20·0
Crumpsall	31	3·43	25·8
Blackley	1	0·11	...
Harpurhey	3	0·17	...
Moston	7	0·49	14·3
Newton Heath	14	0·38	...
Bradford	19	0·78	...
Beswick	10	0·83	...
Clayton	2	0·20	...
Ardwick	10	0·23	...
Openshaw	18	0·65	5·6
Gorton (West)	34	1·12	...
Rusholme and Kirk	3	0·12	...
Chorlton-upon-Medlock	61	1·06	3·3
Hulme	28	0·42	3·6
City of Manchester	**422**	**0·76**	**5·9**

It will be seen from the above table that the largest number of cases was reported from those districts where common lodging-houses are most thickly distributed, viz., Central, Ancoats, Chorlton-upon-Medlock, and St. George's.

The attack-rate, however, shows that Crumpsall was most severely affected. This is due to the presence of two large workhouses, in both of which an outbreak occurred. Central, Ancoats, West Gorton, Chorlton-upon-Medleck, and St. George's are next in order; while Blackley, Rusholme, Cheetham, and Clayton were least affected. The cases in West Gorton were almost entirely due to the recrudescence in the autumn, when 19 cases occurred in that district. The Clayton district remained entirely free from the disease until the 31st December, when two cases were discovered.

Classification of the cases according to sex shows that the number of males greatly exceeds the number of females. This was most marked during the earlier part of the epidemic, when the common lodging-houses were most seriously implicated. The total number of males reported in Manchester during the year was 298, while the females numbered 124.

The principal reason for this undue proportion of males is the fact that the common lodging-houses chiefly affected were those occupied by males. The number of cases of Smallpox actually removed from common lodging-houses or from the Union offices or hospitals, after a short detention there, having previously resided in a common lodging-house, was 96. Of these, 95 were males and 1 a female. Another reason for the excessive number of males is that there was an outbreak of the disease amongst the inmates of two workhouses. Here again the males largely outnumbered the females, 28 males and 2 females having contracted the disease in these institutions. In another workhouse 1 male and 1 female were infected, making the total number infected in the workhouses 29 males and 3 females. In addition, 29 persons contracted the disease outside the City, 5 of these being females and 24 being males.

After due allowance is made for these figures, the males still outnumber the females to a considerable extent, due to the fact that from the nature of their employment and their more active lives, men are more exposed to infection than women.

The age distribution of the cases will be fully discussed when the question of Vaccination is under consideration, but it may be stated here that only 35 cases under 10 years of age were notified.

Before proceeding to give an account of how the disease was spread during the year it will be well to shortly recapitulate the various methods used in controlling the disease. All cases were visited by the Medical Officer of

Health, or his Assistants, partly to verify the diagnosis and also to ascertain the number of contacts, the source of infection, etc., in order to decide more readily on the precautions required. All contacts were urged to be revaccinated, and were kept under observation daily for a period of about six days corresponding to the end of the period of incubation. All cases were removed to hospital, and careful disinfection of the clothing of contacts and of the infected houses was carried out.

The place of work of the patient was always ascertained, and the head of the business was informed, and a request made to him to get the employees revaccinated. This was frequently carried out in a wholesale manner, and in several instances was made almost compulsory.

In several instances the vaccination of employees at large places of business was carried out by the Assistant Medical Officers, who between them vaccinated over 1200 persons during the year. When a case occurred in a common lodging-house an effort was made to get as many of the inmates vaccinated as possible, and a bribe of a shilling was offered, together with the promise that if their arms were so bad as to incapacitate them from work, their food and lodgings would be paid until their recovery. This plan succeeded in the larger lodging-houses, but failed in the smaller ones, where many of the men have regular work.

Handbills relating to Smallpox and Vaccination were also distributed to every house in the City, and posters were placarded all over the town. Handbills of instructions were sent to keepers of common lodging-houses, and a circular was sent to publicans requesting them to report any suspicious eruption.

House to house inspections were frequently made in the affected districts. Inspection of common lodging-houses at night, after being personally worked out by the Medical Officer of Health, was carried out by four inspectors specially instructed for the purpose. They began their work in February, and the value of their work is shown from the fact that they discovered 32 cases.

Vaccination of vagrants was also extensively carried out at the Wood Street Mission, at the Night Asylum, St. John's Parade, and the Church Army Shelter in Ogden Street, and also at the Casual Wards.

By the system of supervision of contacts and house to house visitation, and by careful inquiries into the origin of each case, 152 cases of Smallpox were discovered by the Public Health Officials, which is over one-third of the total for the year.

When a case was once discovered, great pains were taken to get all the contacts, not protected by recent vaccination, vaccinated or revaccinated, whether in common lodging-houses or elsewhere. It is not possible to estimate the number of actual contacts when a case occurred in a common lodging-house. In private houses the number of contacts living in the house, or having visited the patient at the house before removal, can be approximately given. These number 1038 in houses where the person afflicted with Smallpox was discovered within a reasonable time and removed to hospital, *i.e.*, all overlooked cases and their contacts are excluded. Of these, 922 or 88 per cent. were vaccinated or revaccinated, and 16 developed Smallpox, equal to 1·7 per cent.

One hundred and sixteen refused vaccination, or for some reason could not be found. Of these, 20 developed Smallpox, *i.e.*, 17·2 per cent.

Of the 16 revaccinated persons who developed Smallpox, none were revaccinated within three days of infection (the incubation period being taken as 12 days). In nearly all those cases the patients were promptly removed to hospital, and hence the inmates were exposed to infection for a comparatively short period; but in houses where overlooked cases occurred, the contacts would be exposed to infection for a prolonged period (about two weeks as a rule). In these houses 119 probably susceptible contacts (*i.e.*, those not vaccinated within five years) were found, 55 of whom developed Smallpox, which is equal to 46·2 per cent.

Classification of the cases according to position in life is given below. The classification is rather an arbitrary one, and has been founded on a personal knowledge of the patients and their homes, but it shows that persons in a fairly good position in life, and able to get proper nourishment, are by no means exempt from the risk of developing Smallpox:—

Tramps and Inmates of Common Lodging-houses	Persons from very poor Households	Persons able to get good food
106	192	124

TABLE III.—CLASSIFICATION OF THE CASES ACCORDING TO THE SOURCE OF THE ATTACK.

Contracted Outside Manchester		Contracted in Manchester—source traced		Contracted in Manchester—source untraced		
Persons living in a private house	Persons living in a common lodging-house or vagrant	From a known case outside a common lodging-house	From a known case at a common lodging-house	Living at a private house	Living in a common lodging-house	Sleeping out
15	14	192	120	70	10	1

Total ... ... 422.

From the above table it will be seen that there were 29 fresh importations of smallpox during the year, 15 of the cases living in private houses, and 14 being vagrants or inmates of common lodging-houses. In addition, 5 men who are not included in the above were infected at a large works in Stretford. Known cases living in private houses infected 192 persons, 23 of these having contracted the disease while at work, and 32 of them in public-houses. Known cases at common lodging-houses infected 120 persons, 39 of whom lived in private houses. The source of infection in 70 persons living in private houses, 10 in common lodging-houses, and one who slept out, could not be ascertained.

HOW THE DISEASE WAS SPREAD.

In considering the chief influences at work in spreading the disease, it will be well to fully discuss each of the following in order :—

1. Overlooked cases.
2. The influence of common lodging-houses.
3. Tramps.
4. Public-houses.
5. Places of work.

(1)—*Overlooked Cases.*

The overlooking of mild cases was the chief cause of the spread of the disease, not only in common lodging-houses, but also in private houses, and indeed under all the above headings. The attack as a rule was so mild that no medical advice was sought, or, as happened in not a few instances, was not recognised as Smallpox by the medical attendant. In fact this matter is of so much importance that it is not too much to say that if there had been no case overlooked there would have been practically no Smallpox outbreak in Manchester. The following is a complete list of all the known overlooked cases, and the cases infected directly and indirectly from them. The cases are denoted by their number in the Register :—

Table IV.—Overlooked Cases and the Cases Infected by them.

Column I. Overlooked case	Column II. Cases infected directly by the overlooked case	Column III. Cases infected by those in Column II.	Column IV. Cases infected by those in Column III.	Column V. Cases infected by those in Column IV.	Column VI Cases infected by those in Column V.
Case 1.	2, 11, 12, 13, 14, 15	21			
Case 25.	49, 50, 51, 67				
Case 34.	30, 31, 32				
Case 60.	54, 55, 56, 57, 59, 61, 62, 63, 64, 65, 71, 72, 74, 75, 76, 80, 85, 91, 92, 101, 141 (overlooked)	116, 117, 118, 120, 123, 126 (?), 131, 140, 142, 144, 145, 146, 149, 150, 151, 164 (overlooked), 174	152, 163, 165, 177, 190, 191, 196, 199, 239 (overlooked), ? wife of 219	208 (?), 219, 232, 214, 233	252, 253
Case 95.	93, 94				
Case 102.	103, 104				
Case 106.	105, 107, 121, 122				
Case 133.	134 (overlooked), 135 (overlooked), 136				
Case 156.	147, 153, 154, 155, 158, 162, 181				
Case 184.	185				
Case 187.	188 (overlooked)	206, 209, 226	255		
Case 192.	193 (overlooked), 194, 201	245			
Case 204.	220, 223, 224, 227, 230, 231, 234, 235, 236, 237, 238, 240, 242, 243, 244, 246, 247, 248, 249, 250, 267 (?) (overlooked)	254, 258 (?), 263, 265, 272 (overlooked), 277 (overlooked), 266, 290	310, 279, 280, 283, 296, 276, 278	332, 333 (?), 338	356
Case 210.	200, 205				
Case 212.	213				
Case 217.	216				
Case 256.	257				
Case 297.	298				
Case 323.	314				
Case 328.	329, 330, 341				
Case 358.	359, 360, 362				
Case 365.	320, 326				

TABLE IV.—OVERLOOKED CASES AND THE CASES INFECTED BY THEM—*continued.*

Column I. Overlooked Case	Column II. Cases infected directly by the overlooked case	Column III. Cases infected by those in Column II.	Column IV. Cases infected by those in Column III.	Column V. Cases infected by those in Column IV.	Column VI. Cases infected by those in Column V.
Case 366.	344 (overlooked), 354	347, 348, 349, 353	385 (*a*)		
Case 371.	372	379, 382			
Case 377.	376, 378, 380, 381				
Case 390.	391 (overlooked), 392 (overlooked), 393 (overlooked), 386, 387	389, 394			
Case 395.	396, 397, 398, 399	407 (overlooked)	408, 409		
Case 400.	401, 402, 405				
Case 403.	404, 406				
Case 420.	421				

The above table shows that 30 overlooked cases were directly responsible for the infection of 115 persons, 10 of whom were also overlooked, but of these 3 did no damage as far as could be ascertained. Indirectly through cases already infected, the same 30 overlooked cases accounted for 70 additional cases of Smallpox, making a total of 186 cases (over three-sevenths of the total number) having their origin in cases known to have been overlooked.

As is to be expected, overlooked cases have the greatest potency for harm where a large number of persons may come in close contact with the infected person, as in common lodging-houses and in public-houses. In the above list, cases No. 60 and No. 204 both occurred in common lodging-houses, and cases No. 156 and No. 187 were publicans.

The most notorious of the overlooked cases was that of J—— W—— (case 60). This man at the beginning of January was living in a common lodging-house in Shepley Street, London Road, where there were several cases of Smallpox at that time. About the end of the first week of January he left Shepley Street and took up his abode at a common lodging-house in Grosvenor Street, Chorlton-upon-Medlock. Here he developed an attack of Smallpox, which was not recognised. He continued to live at this lodging-house, and infected 8 men there, while 2 other men who lived at this lodging-house during the most infectious period of the case in question also developed the disease, one in a common lodging-house in Lower Chatham Street and one in a private house in Chorlton-upon-Medlock, this latter being also overlooked and infecting 3 other persons. In addition, J—— W—— continued at his work

during his illness, and infected his master and 3 workfellows. He also infected 4 men from another common lodging-house in Grosvenor Street who used to mix with the men at the first lodging-house. He also visited his wife—a hard-working woman in Ancoats—and infected her and her niece, who lived with her, whilst his brother, who lives in another part of Ancoats, was also visited, and likewise contracted Smallpox.

A publican was also infected by him, so that this one individual is known to have infected 21 persons, affecting 3 common lodging-houses, 1 public-house, a workshop, and 7 private houses.

His responsibility, however, does not end here, as these 21 persons in their turn infected 17 others. At each succeeding crop the numbers diminish, but 16 other cases at least belong to this series, making the total for which this man is responsible into the enormous sum of 54 cases. He may well have been the source of other cases, but the above number represents the cases known to have originated from him.

Another case which was the source of grave harm was that of J—— A—— (case 204). This man, while living at Walton House in Harrison Street, Ancoats, developed an attack of Smallpox which was not recognised for over a week, and it was not known at the time of his discovery that he had lived in this lodging-house.

Subsequently 14 cases were removed from this lodging.house, and 2 cases who had lived there during the time of infection, and had subsequently removed to private houses, were also notified. Three other cases in private houses appeared to have their origin from this man. He infected a publican whose beerhouse he went to, and also a customer at the beerhouse. Thus, this one overlooked case was the direct cause of 21 cases of Smallpox, affecting 1 common lodging-house, 1 public-house, and 5 private houses. In addition, these 21 cases infected 8 other cases, 2 of which were again overlooked and infected 6 persons. In addition, 5 other cases were traced to the same source with a tolerable degree of certainty. Thus the total number of cases for which this overlooked case is responsible is 40.

These are the two overlooked cases which infected the greatest number of persons, but all the others in the above table contributed a share more or less great. It must not be taken for granted that the cases given in the table comprise all the cases which had their origin from these overlooked cases, but only those the source of which could reasonably be attributed to them.

When it is stated that the sources of 70 cases in private houses and 10 in common lodging-houses could not be traced to any source, it is reasonable to suppose that a large proportion of them must have been due to overlooked cases, either those mentioned in the above table or others not discovered.

In addition to those cases known to have been overlooked, a number of persons were in all probability infected by overlooked attacks which could not be diagnosed with certainty at the time of the occurrence of the cases in question, or the persons who are supposed to have had the disease could not be found to be examined. In the following table these cases are given in detail :—

TABLE V.

(?) Overlooked Case	Cases directly infected	Cases infected indirectly
(?) Case at work.....	No. 5 (another case in Salford at the same time, worked at the same place).	
(?) Overlooked case in a charwoman at the place of work.	No. 66 (also a case in Salford).	
(?) Tenant of house—a few suspicious stains on legs and arms.	109.	
(?) Keeper of common lodging-house.	157 (?), 160, 167, 168, 179.	
(?) Son, slight, overlooked case.	175.....	202.
(?) Lodger, overlooked case.	176.	
(?) Wife, overlooked case ...	340.	
(?) Overlooked case in Droylsden.	345.	
(?) Overlooked case at Retford.	115, 119.	
(?) Overlooked case who worked at Clayton Hospital.	346.	
(?) Brother, overlooked case.	351^1, 352^2, 357.	
(?) Overlooked case in Salford.	388.	
(?) Overlooked case at a large works in Stretford.	413, 414, 415, 416, 417.	

It is a matter of supreme importance in the prevention of the spread of Smallpox that the cases should be promptly removed to an isolation hospital. If any considerable delay occur, the measures which are taken to prevent the propagation of the disease are often rendered futile. In this connection the following cases, although not overlooked, are of much interest, and will be here set down in tabular form, with the number of cases originating therefrom, and the number of days between the appearance of the rash and removal to hospital.

TABLE VI.—CASES DIAGNOSED LATE AND THE CASES ORIGINATING THEREFROM.

No. of Case	No. of days between the appearance of the rash and removal to Hospital	Cases Infected	
Case 10	5	27, 29, 33, 37, 38	† Nearly all the cases in a large Workhouse
Case 23	6	78	
Case 24	5	53	
Case 78	4	110, 111, 132	
Case 117	4	163	
Case 148	4	182, 183	
Case 264	3	281 (?), 285, 286, 289	
Case 289	2	303, 305, 306, 307, 308, 311, 313, 315, 316, 317, 318, 324, 325	
Case 293	4	312	
Case 299	3	(?) Wife of 340	340
Case 368	4	373, 374, 375	
Case 372	3	379, 382 (?)	
Case 410	9	411, 412	

Of the above infected persons, 10 were revaccinated immediately on the discovery of the original case, but all contracted the disease, as the period intervening between the infection entering the system and the process of vaccination was over three days in each case.

Attacks of Smallpox of so mild a nature as to be overlooked through medical advice not being sought, are much more likely to occur in the vaccinated than in the unvaccinated, but there were a few of the overlooked cases given in the table which were in unvaccinated persons. Cases which have been wrongly diagnosed have practically the same effect in spreading the disease as cases having no medical attendant. Both are included in the table of overlooked cases. There was only one unvaccinated case with an attack so mild that no medical advice was sought. This was in a child 12 months of age (case 407). Two other unvaccinated cases which occur in the list (Nos. 391, 392), and a third case (No. 390), which was vaccinated in infancy, but unsuccessfully, were all diagnosed as Chicken-pox. Two overlooked cases in vaccinated persons (Nos. 156 and 400) were also diagnosed as

Chicken-pox. Case 78, which appears in the table of cases diagnosed late was thought to be Chicken-pox in the first instance, while another case (No. 211) was also diagnosed as Chicken-pox, but was discovered before any material harm resulted.

(2)—*The Influence of Common Lodging-houses.*

The common lodging-house, where the inmates are herded together both in the sleeping and the day rooms, but especially the latter, gives exceptional opportunities for the spread of the disease on the occurrence of a case, especially of an overlooked case. In all, 96 cases were removed from common lodging-houses or from the Union offices or workhouses, having previously resided in a common lodging-house, and having received the infection there. Of these, 95 were males and 1 a female.

The number of common lodging-houses involved was 28. The greater number of these cases occurred in the earlier part of the epidemic, as, after the institution of the regular night inspection of common lodging-houses in February, there was only one serious outbreak in a common lodging-house, this being due to the overlooked case (No. 204) already referred to.

The disease once having got hold in a common lodging-house may spread into the general population. In fact, this occurred to an extent not easily estimated. It is known, however, that 39 persons living in private houses were directly infected from persons living in common lodging-houses. It is comparatively easy to control the disease in private houses, where all the contacts can be kept under observation; but in lodging-houses, where the inmates move from town to town, and from lodging-house to lodging-house, this cannot be so efficiently carried out. Two cases removed from lodging-houses during the initial illness were the origin of outbreaks of the disease amongst the inmates of two of the large workhouses. At Crumpsall Workhouse the disease was first introduced by a man who was admitted on January 8th from a common lodging-house in Angel Meadow. The disease was not at first recognised, and the patient was not removed to Clayton Hospital until January 12th. Six cases were infected from this man. On January 22nd another case from a lodging-house, and on January 28th a third case from the casual wards was admitted into the Workhouse Hospital. From these and the previous cases, 11 additional cases were infected, making a total of 17 persons infected in this workhouse. Extensive revaccination was carried out, so that practically the whole of the inmates were revaccinated. The valuable effect of this measure is evident from the fact that at various later periods the disease was introduced in the same manner as before on 7 distinct occasions and not a single additional case was infected in the institution. The second outbreak occurred at Prestwich Union Workhouse. The disease was introduced by a man from a common lodging-house in Strangeways, who was admitted on May 5th suffering from the initial illness. The eruption appeared

on May 6th, and he was removed to Clayton Hospital on May 8th. Meanwhile, 13 other persons contracted the disease from him. Extensive revaccination was carried out, and no further case occurred. Smallpox was introduced into Withington Workhouse on 7 occasions—6 times from common lodging-houses and once from a private house. Two cases were infected in the institution, the origin of these cases not being wholly clear.

(3)—*Tramps.*

Vagrants are the chief cause of Smallpox spreading from town to town. An infected tramp on arriving at a town takes up his abode at the casual wards or at a common lodging-house. In either of these places, if undetected, he has a most favourable opportunity for spreading the disease. 14 cases known to have been infected outside Manchester were discovered either in the casual wards or in common lodging-houses.

(4)—*Influence of Public-houses.*

Publicans and their servants are exposed to exceptional risks of contracting Smallpox. Slight cases, after the appearance of the rash, feel perfectly well, and are able to go about their work, and enter public-houses. As a result, 16 publicans or their servants developed Smallpox and 16 other persons were infected in public-houses. An overlooked case in a publican or a servant serving in the bar has a special opportunity of spreading infection, owing to the number of contacts in such a place. Two such instances occurred during the year. The first was that of a publican (case 156) who had an illness followed by an eruption, which was diagnosed as Chicken pox. Subsequently seven frequenters of this public-house developed Smallpox. The second instance is that of another public-house where the publican's wife (case 187) had an overlooked attack of Smallpox and infected her husband, who was also overlooked, and who is known to have infected 3 other persons, these being followed by another case (see table of overlooked cases). The other cases infected in public-houses were infected by persons who frequented these public-houses while in an infectious condition.

(5)—*Places of Work.*

A number of cases had their origin from contact with a fellow-worker suffering from the disease. The source of infection in 23 cases could be traced with tolerable certainty to an infected workfellow, but the disease never got a proper hold of any place of work owing to the energetic action of the owners of such places, who, in many instances, practically insisted on all their employees being vaccinated.

Vaccination and Schools.

In no school was there an outbreak of Smallpox, but in certain schools where it was evident that there was considerable danger of an outbreak a vaccination census was taken. This was done in the first instance by one of the Assistant Medical Officers, but later was undertaken entirely by

Dr. Ritchie, the Medical Officer to the Education Authority, who furnished full reports to the Medical Officer of Health on the subject. The principal schools examined were in the outlying districts of the City, chiefly in West Gorton.

ARMITAGE STREET SCHOOL.

Department	No. Examined	No. Unvaccinated	Percentage
Infant	296	94	31·8
Junior boys	185	33	17·8
Senior boys	277	26	9·3
Girls	457	62	13·5
Total	1215	215	17·6

ST. MARK'S SCHOOL.

Infant	199	51	25·6
Other departments	586	77	13·1
Total	785	128	16·3

ALL SAINTS' SCHOOL.

Infant	249	83	33·3
Girls	342	73	21·3
Boys	364	83	22·8
Total	955	239	25·0

Another school, situated in Outer Gorton, to which a large number of children from districts within the City go, was also examined with the consent of the Medical Officer of Health for Gorton.

ST. FRANCIS' SCHOOL.

Department	No. Examined	No. Unvaccinated	Percentage
Infant	283	79	27·9
Girls	440	83	18·8
Boys	415	69	16·6
Total	1138	231	20·2

In addition, another school near the centre of the City was examined by Dr. Forbes earlier in the year, and 5 per cent. of the children examined were found to be unvaccinated. It would thus appear that there is less stringency in the enforcement of the Vaccination Acts in the outlying districts than in the more central districts. The younger the children examined, the higher

the percentage of the unvaccinated. It is rather alarming to find that nearly one-third of the infants in the schools examined were found to be unprotected by vaccination. An effort was made to get those unprotected children vaccinated, with a fair degree of success.

CONSIDERATION OF THE CASES OF SMALLPOX TREATED IN CLAYTON VALE HOSPITAL.

The number of Manchester cases treated in the hospital during the year was 418. In the remaining four cases the patients had passed the infectious stage before they were discovered, and were only admitted for disinfection of person and clothing. In addition, five cases from outside districts were treated in the hospital, making a total of 427 cases of Smallpox which were dealt with during the year. The largest number of cases under treatment at any one time was 97, so that the accommodation of the hospital as at present constituted was never fully taxed.

The chief part of the treatment as carried out at Clayton Hospital was the oiling of the body twice daily with a 2·5 per cent. solution of carbolic oil. In mild cases nothing more is required, apart from a generous diet; but in bad cases the whole body is enveloped in lint, soaked in boric solution, and covered with gutta-percha tissue. The face is covered with a mask of the same material. Apart from good food and stimulants in the severer cases, and the treatment of the complications as they arise, nothing further is, in general, needed.

The object of the oiling of the bodies of the patients is chiefly to prevent the aerial conveyance of the disease. In this it was completely successful, for no part of the town was more free from the disease than that immediately surrounding the hospital. While all the other districts in the City had been more or less affected during the year, the Clayton district, on the outskirts of which the hospital is situated, had not had a case of Smallpox in it until the 31st December, 1903, when two cases were discovered. These were not in any way connected with the hospital, as they could be traced to another source. Further, large crowds, sometimes numbering hundreds, collected round the hospital on Saturdays and Sundays, either in the hope of seeing their friends who were patients in the hospital or through some morbid curiosity, and yet no cases were reported amongst these. A number of men were employed near the hospital laying drains, etc., but none of them developed Smallpox, although most of them refused to be vaccinated.

A railway signalman who worked in a cabin near the hospital developed Smallpox. He lived in Harpurhey, and it seemed probable that the disease was contracted from another source. Thus, there was no case which could be said to be due to infection by aerial conveyance of the disease.

The following cases may have been due to direct infection at the hospital :— A man who was employed at the hospital as a painter, and who refused to be vaccinated, developed a mild attack, which was overlooked, and another case

was infected from him. The landlady of a man employed at the hospital as a gardener developed Smallpox, and on examination it seemed probable that this man may have had a very mild overlooked attack, although there was no history of any illness. He had not been revaccinated when he commenced work at the hospital, as he stated that he had had Smallpox previously. A man who carted coke to the hospital was examined five weeks after an illness, as his brother's wife had contracted Smallpox. No sign of Smallpox could be found on this man, and neither the man himself nor his brother had observed any eruption on him.

These are the only cases which can in any way be connected with the hospital, so that the oiling of the patients seems to be a satisfactory preventitive of the aerial conveyance of Smallpox. Great care was also taken in the cleansing of the wards, so that the amount of dust was reduced to a minimum. Only in those patients who suffered from the severer forms of the disease was there any subsequent pitting observed, so that the treatment carried out seems to have had a beneficial effect in that direction also.

Symptoms.

In the initial illness the most constant symptoms complained of were intense frontal headache and chilliness. Lumbar pain was also a frequent symptom, although pain in the stomach or bowels was nearly if not quite as common. Vomiting was not a frequent symptom, although it was present in some cases.

The period of incubation in cases where it could be calculated with certainty —*i.e.*, where there was only one exposure to infection—was almost invariably twelve days. The two following cases were apparently infected *in utero* :— Case 2.—Was born on December 24th (evening), and the eruption of Smallpox appeared on the morning of January 3rd. The attack was confluent, and the child died on January 13th; it was unvaccinated. As 12 days may be taken as the period between infection and the appearance of the rash in the infant, it will be seen that this case was probably infected before birth. The mother had an overlooked attack of Smallpox, having sickened on December 20th, and the eruption having appeared on December 24th. Case 385A.—Was born on June 26th, and was vaccinated the same day because the mother had sickened with Smallpox on June 25th, date of rash being June 26th. The vaccination took well, but on July 3rd the rash of severe discrete Smallpox appeared, and the child died on July 15th. Taking the interval between infection and the appearance of the rash as 10 days at least, this child must have been infected at least three days before birth—that is while the mother was still in the incubation period.

Initial rashes were seen in a few cases only, but at the stage at which the patients are admitted to hospital these would usually have disappeared, or would at least be so faint as to be unrecognisable. The most common initial

rash observed was a petechial one, affecting the groins and lower abdominal areas, and occasionally the flexures of the elbows. This was observed in four cases. A scarlatinal rash of general distribution was noted in one case, and a measly or macular eruption affecting chiefly the extensor surfaces of arms and legs was seen in two cases.

The papular eruption of Smallpox appeared at periods varying from one to five days after onset, but in the great majority of cases the rash appeared on the third day. The period of isolation in hospital varied greatly in different cases according to the stage of the disease on admission, the severity of the attack and the complications, and the state of the patient as regards vaccination. The following table gives the duration of isolation in hospital of all cases admitted within four days of the appearance of the eruption, all fatal cases and cases admitted with a rash more than four days old being excluded. They are divided into vaccinated, unvaccinated, and vaccination doubtful, and the percentages are calculated on the total number of vaccinated, unvaccinated, and doubtfully vaccinated cases admitted during the year.

TABLE VII.—SHOWING DURATION OF ISOLATION IN HOSPITAL IN RELATION TO CONDITION AS TO VACCINATION.

Period of Isolation	VACCINATED		UNVACCINATED		VACCINATION DOUBTFUL	
	No. of Cases	Percentage of total vaccinated cases admitted	No. of Cases	Percentage of total unvaccinated cases admitted	No. of Cases	Percentage of total cases admitted with doubtful vaccination
0— 14 days ...	85	23·8	...	...	2	6·4
14— 21 days ...	81	22·7	4	12·1	3	9·7
21— 28 days ...	45	12·6	3	9·1	4	12·9
4— 6 weeks ...	54	15·1	7	21·2	4	12·9
Over 6 weeks ...	39	10·9	6	18·2	7	22·6

In the vaccinated the percentages tend to decrease towards the longer period of isolation, while in the unvaccinated and in the cases with doubtful vaccination the percentages increase towards the longer isolation period.

In all, 87 cases were discharged within 14 days of admission. It is certain that Smallpox patients are free from infection when all the scabs are off and when complications such as boils are absent. That no return cases occurred is a proof that longer isolation in hospital was unnecessary.

Table VIII.—Showing, Age, Sex, Fatality, and Vaccination of Smallpox Cases.

Age		Vaccinated			Unvaccinated			Vaccination Doubtful			Cases Vaccinated successfully only after Infection			TOTAL		
		No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.
0–4	M.	...	...	...	3	1	25·0	1	...	...	1	1	50·0	5	2	21·4
	F.	...	...		5	1		3	...		1	...		9	1	
5–14	M.	12	...	...	3	2	18·2	1	...	...	...	...	...	16	2	5·8
	F.	7	...		8	...		3	...		...	...		18	...	
15–24	M.	39	...	...	4	...	...	4	...	...	2	...	...	49	...	...
	F.	27	...		3	...		...	...		...	...		31	...	
25–44	M.	147	2	2·5	5	1	16·6	8	1	20·0	1	...	...	161	4	3·6
	F.	55	3		1	...		2	1		...	...		58	4	
45–64	M.	56	6	10·9	1	1	100·0	3	1	25·0	1	...	...	61	8	12·8
	F.	8	1		...	...		1	...		...	...		9	1	
65+	M.	4	1	20·0	...	...	...	4	2	40 0	...	...	...	8	3	30 0
	F.	1	...		...	...		1	...		...	...		...	...	
All Ages	M.	258	9	3·6	16	5	18·1	21	4	16·1	5	1	16·6	300	19	5·8
	F.	98	4		17	1		10	1		1	...		126	6	

VACCINATION.

In considering the question of vaccination and its relation to the mortality from Smallpox and to the severity of the disease, there are 426 cases available for classification. In one case the vaccination bed-card was lost, and although the case is known to have been a vaccinated one, and had the discrete form of the disease, it has been omitted from the vaccination statistics, as the full vaccination particulars were not available. An effort was made to find the man after his discharge, but as he lived in a common lodging-house and had changed his address it was not successful. In Table VIII. the age, sex, fatality, and condition of vaccination are shown. There were 356 vaccinated cases admitted during the year (in addition to the one above referred to)—258 were males and 98 females; amongst these there were 13 deaths, which is equal to a case fatality of 3·6 per cent. It has also to be noted that there was no vaccinated case admitted below the age of 5 years, and comparatively few below the age of 15. One child, aged two years, stated to have been vaccinated but not to have taken properly, had two large cicatrices on the usual seat of vaccination marks, but those looked more like scalds than vaccination marks, and in addition there was a similar cicatrix over the outer aspect of the elbow. This case has been classified under vaccination doubtful. Again, amongst the vaccinated cases there is no death shown in the table below the age of 25 years, and the age of the youngest vaccinated person who died from the disease was 38 years. As all the fatal cases were vaccinated in infancy only, the fatality increases according to the remoteness of the vaccination.

The unvaccinated cases numbered 33, with 6 deaths, giving a case fatality per cent. of 18·1. There were eight cases admitted under five years of age; two of those were fatal. There were also two deaths amongst 11 cases in the age-group 5–14. Although the cases are too few in number to draw any definite general conclusions, the table certainly shows that the case fatality per cent. has a tendency to decrease as we recede from childhood the converse of what was found amongst the vaccinated cases.

Amongst the cases classified as vaccination doubtful are included those stated to have been vaccinated but with no marks, those where vaccination was uncertain, and also those patients on whom no marks of vaccination were found and who could make no statement, such as patients delirious on admission, in whom the disease proved fatal. In no case under this heading were there any marks which could reasonably be attributed to vaccination. There were 31 such cases with five deaths, giving a case fatality of 16·1 per cent. There was no death under 25 years of age, and the case fatality increases with advancing years.

The fourth heading was inserted to include a few cases which could not properly be included under any of the other headings. These cases were successfully vaccinated only after exposure to infection. All were vaccinated on or after the fourth day of the incubation period—too late to entirely prevent the disease, but probably in most cases considerably modifying it. There were six of these cases with one death, that of a child infected *in utero* already referred to.

TABLES :—Showing Age, Number of Deaths, and Fatality per cent. of Smallpox Cases, according to Severity of Attack.

TABLE IX.—(1) VACCINATED CASES.

AGE-GROUPS	0—4			5—14			15—24			25—44			45 and upwards			TOTALS		
Character of Attack	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.
Discrete	...	...	...	19	...	...	62	...	...	178	...	...	57	...	...	316	...	...
Semiconfluent.....	...	...	...	...	...	...	4	...	...	14	...	...	7	3	42·9	25	3	12·0
Confluent	...	...	...	...	...	...	...	...	...	4	2	50·0	4	4	100·0	8	6	75·0
Hæmorrhagic	...	...	...	...	...	...	...	...	...	6	3	50·0	1	1	100·0	7	4	57·1
All cases.....	...	...	...	19	...	...	66	...	...	202	5	2·5	69	8	11·6	356	13	3·6

Table X.—(2) Unvaccinated Cases.

Age-Groups	0—4			5—14			15—24			25—44			45 and upwards			Totals		
Character of Attack	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.
Discrete	6	...	...	6	...	...	4	...	...	4	...	...	...	...	...	20	...	...
Semiconfluent	...	...	...	2	...	...	2	...	...	...	...	...	...	...	...	4	...	...
Confluent	2	2	100·0	1	...	...	1	...	...	2	1	50·0	1	1	100·0	7	4	57·1
Hæmorrhagic.....	...	...	...	2	2	100·0	...	...	...	...	...	...	...	...	...	2	2	100·0
All Cases	8	2	25·0	11	2	18·1	7	...	...	6	1	16 0	1	1	100·0	33	6	18·1

Table XI.—(3) Cases with Doubtful Vaccination.

Age-Groups	0—4			5—14			15—24			25—44			45 and upwards			Totals		
Character of Attack	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.
Discrete	3	...	...	4	...	...	3	...	...	7	...	...	6	...	...	23	...	...
Semiconfluent..... ...	1	...	...	...	...	...	1	...	...	1	..	...	1	1	100·0	4	1	25·0
Confluent	...	...	...	...	...	...	...	...	...	2	2	100·0	1	1	100·0	3	3	100·0
Hæmorrhagic.....	...	...	...	...	...	...	...	...	...	...	...	...	1	1	100·0	1	1	100·0
All Cases.....	4	...	...	4	...	...	4	...	...	10	2	20·0	9	3	33·3	31	5	16·1

Table XII.—(4) Cases Vaccinated Successfully only after Infection.

Age-Groups	0—4			5—14			15—24			25—44			45 and upwards			Totals		
Character of Attack	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.	No. of Cases	No. of Deaths	Fatality per cent.
Discrete	2	1	50·0	...	...	...	2	...	...	1	...	...	1	...	...	6	1	16·6

Tables IX., X., XI., XII. show the cases classified according to age and fatality, with special reference to the severity of the attack. As regards the latter, the cases are divided into discrete, semiconfluent, confluent, and hæmorrhagic. Under "hæmorrhagic" are included the hæmorrhagic cases proper (black smallpox), all of which were fatal, and also the sub-hæmorrhagic cases (variola hæmorrhagica pustulosa); the recoveries belong to the latter group. Amongst the vaccinated cases there was no case at all below five years of age, no semiconfluent case below 15 years, and no confluent or hæmorrhagic case below 25 years. Amongst the unvaccinated, not only do we find cases in the first age-group, but we find confluent cases there, and also hæmorrhagic cases below 15 years of age. As already seen in discussing Table VIII., the particulars of cases with doubtful vaccination resemble the vaccinated in their fatality grouping. There are a few cases at the earlier age-period, but no confluent or hæmorrhagic case below the age of 25.

Tables showing the relationship of the severity of the disease to the number of primary vaccination marks:—

TABLE XIII.—(1) DISCRETE ATTACKS: NUMBER OF CASES.

* = A Death.

Age-Groups	0-4	5-14	15-24	25-44	45 +	TOTALS		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	6	6	4	4	...	20	...	...
Vaccination doubtful ...	3	4	3	7	6	23	...	...
1 mark	...	3	4	21	13	41	...	...
2 marks	...	2	15	53	27	97	...	...
3 marks	...	3	21	46	9	79	...	...
4 marks	...	7	15	32	1	55	...	...
Over 4 marks	...	...	...	2	...	2	...	...
Totals	9	25	62	165	56	317	...	...

Table XIV.—(2) Semiconfluent Attacks.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45+	Totals		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	...	2	2	...	...	4	...	...
Vaccination doubtful	1	...	1	1	* 1	4	1	25·0
1 mark	...	...	...	2	* 3	5	1	20·0
2 marks.....	...	...	3	4	1	8	...	...
3 marks.....	...	...	...	2	...	2	...	...
4 marks.....	...	...	1	4	* 1	6	1	16·6
Over 4 marks	...	...	...	1	...	1	...	...
Totals.....	1	2	7	14	6	30	3	10·0

Table XV.—(3) Confluent Attacks.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45+	Totals		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	** 2	1	1	* 2	* 1	7	4	57·1
Vaccination doubtful	...	...	...	** 2	* 1	3	3	100·0
1 mark	...	...	...	* 1	* 1	2	2	100·0
2 marks.....	...	...	...	1	* 1	2	1	50·0
3 marks.....	...	...	...	* 1	** 2	3	3	100
4 marks.....	...	...	...	...	...	...	...	...
Over 4 marks	...	...	...	1	...	1	...	...
Totals.....	** 2	1	1	***** 8	****** 6	18	13	72·2

Table XVI.—(4) Hæmorrhagic Attacks.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45 +	Totals		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	...	** 2	...	...	...	2	2	100
Vaccination doubtful ...	...	...	...	...	* 1	1	1	100
1 mark	...	...	...	* 1	* 1	2	2	100
2 marks	...	...	...	** 3	...	3	2	66·6
3 marks	...	...	...	1	...	1	...	...
4 marks	..	...	...	1	...	1	...	...
Over 4 marks	...	...	...	...	...	...	...	...
Totals	...	** 2	...	*** 6	** 2	10	7	70·0

The four tables in which the relationship of the severity of the disease to the number of primary vaccination marks is set out do not show any striking evidence of the superiority of four marks over one when considered separately; but if we deal with them as a whole, and take all the cases with the same number of marks, and calculate the case fatality on the totals, we find the following :—

33 cases were unvaccinated :	No. of deaths = 6	Case fatality = 18·2 per cent.	
31 ,, had doubtful vaccination :	,, = 5	,, = 16·1	,,
50 ,, ,, 1 vaccination mark :	,, = 5	,, = 10·0	,,
110 ,, ,, 2 ,, :	,, = 3	,, = 2·7	,,
85 ,, ,, 3 ,, :	,, = 3	,, = 3·5	,,
62 ,, ,, 4 ,, :	,, = 1	,, = 1·6	,,
4 ,, ,, over 4 ,, :	,, 0	,, 0	

Tables showing the relationship of the severity of the disease to the total area of the primary vaccination marks :—

TABLE XVII.—(1) DISCRETE ATTACKS: NUMBER OF CASES.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45 +	TOTAL		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	6	6	4	4	...	20	...	...
Vaccination doubtful ...	3	4	3	7	6	23	...	...
Area up to ¼″	...	1	4	14	14	33	...	...
¼″—½″	...	4	7	27	14	52	...	...
½″—1″	...	6	19	55	18	98	...	...
Over 1″	...	4	25	58	4	91	...	...
Total	9	25	62	165	56	317	...	...

TABLE XVIII. (2) SEMICONFLUENT ATTACKS.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45 +	TOTAL		
						No. of Cases	No. of Deaths	Fatality per cent.
Unvaccinated	...	2	2	...	...	4	...	...
Vaccination doubtful ...	1	...	1	1	* 1	4	1	25·0
Area up to ¼″	...	...	1	2	* 3	6	1	16·6
¼″—½″	...	...	1	2	* 1	4	1	25·0
½″—1″	...	...	1	3	1	5	...	...
Over 1″	...	...	1	6	...	7	...	...
Total	1	2	7	14	* * * 6	30	3	10·0

Table XIX.—(3) Confluent Attacks.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45 and Upwards	Total No. of Cases	Total No. of Deaths	Total Fatality per cent.
Unvaccinated	** 2	1	1	* 2	* 1	7	4	57·1
Vaccination doubtful ...	...	...	...	* * 2	* 1	3	3	100·0
Area up to ¼″	...	...	...	...	* * 2	2	2	100·0
¼″—½″	...	...	...	* 1	* * 2	3	3	100·0
½″—1″	...	...	...	1	...	1	...	...
Over 1″	...	...	...	* 2	...	2	1	50·0
Total	** 2	1	1	***** 8	****** 6	18	13	72·2

Table XX.—(4) Hæmorrhagic Attacks.

* = A Death.

Age-Groups	0–4	5–14	15–24	25–44	45 and Upwards	Total No. of Cases	Total No. of Deaths	Total Fatality per cent
Unvaccinated	...	** 2	...	...	...	2	2	100·0
Vaccination doubtful ...	...	...	...	...	* 1	1	1	100·0
Area up to ¼″	...	...	...	* 1	* 1	2	2	100·0
¼″—½″	...	...	...	** 2	...	2	2	100·0
½″—1″	...	...	...	3	...	3	...	...
Over 1″	...	...	...	...	...	...	...	...
Total	...	** 2	...	*** 6	** 2	10	7	70·0

In the four tables showing the relationship of the total area of the primar vaccination cicatrices to the severity of the disease and to the mortality ther is distinct evidence in favour of a fairly large area. There is only one death in cases with an area of over half a square inch. A better indication of the value of the size of the vaccination marks is got when all the cases with the

same area are added together and the case fatality worked out, as was done when the value of the number of marks was being considered :—

33 cases	were unvaccinated...	Deaths numbered 6 :	Case fatality = 18·2 per cent.
31 „	had doubtful vaccination	„ „ 5 :	„ = 16·1 „
43 „	„ area of vaccination cicatrices of up to ¼″	„ „ 5 :	„ = 11·6 „
61 „	„ „ from ¼″– ½″...	„ „ 6 :	„ = 9·8 „
107 „	„ „ „ ½″– 1″...	„ „ 0 :	„ = ... „
100 „	„ „ over 1″...	„ „ 1 :	„ = 1·0 „

Vaccination, and the Severity of the Disease in Children.

Dealing separately, now, with children of the age of 0–10, we find that of the vaccinated none developed a severe form of the disease, while the great majority had the very mildest form. Of the unvaccinated, 8 had discrete attacks, 6 had the severer forms, and only 2 had the milder forms of the disease. Of the children with doubtful vaccination, 6 had discrete attacks and 1 was semiconfluent. These facts are set down side by side in the following table :—

TABLE XXI.—CHILDREN AGED 0–10.

Type of Disease	Vaccinated	Unvaccinated	Vaccination doubtful	Vaccinated in Incubation period only
Very mild discrete	7	1	...	...
Mild discrete	2	1	...	...
Discrete	1	8	6	2
Semiconfluent	...	2	1	...
Confluent	...	2	...	...
Hæmorrhagic	...	2	...	...

* TABLE XXII.—SHOWING THE ESTIMATED NUMBER OF THE POPULATION AND NUMBER OF ATTACKS UNVACCINATED AND VACCINATED, AND THE NUMBER OF DEATHS.

Age Periods	0-14	15-24	25-44	45 and upwards
Population	179,094	114,109	167,689	93,439
Attacks Unvaccinated...	19	7	6	1
Deaths	4	...	1	1
Attacks Vaccinated ...	19	66	202	69
Deaths	...	...	5	8

* This Table shows Manchester cases only.

TABLE XXIII.—REVACCINATIONS.—(NO. OF CASES.)

* = A Death.

DATE OF REVACCINATION	1—10 years	10—20 years	20—30 years	Over 30 years	Time uncertain	Revaccinated in the Incubation Period
Discrete	3	3	3	6	2	26
Semiconfluent	...	...	...	1	...	1*
Confluent	...	...	...	...	...	...
Hæmorrhagic	...	...	...	...	...	...

TABLE XXIV.—SHOWING THE NUMBER OF CASES VACCINATED OR REVACCINATED DURING THE PERIOD OF INCUBATION.

* = A Death.

DAY OF INCUBATION ON WHICH THE VACCINATION WAS PERFORMED	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Discrete	...	...	...	7	5	4	7	2	1	...	3	3
Semiconfluent	...	...	...	...	* 1	...	...	...	...	...	...	...
Confluent	...	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhagic.....	...	...	...	...	...	...	...	...	...	...	...	...

Amongst 18 cases where revaccination had been performed at various periods before infection there was no death. All the cases were discrete with one exception, which was semiconfluent, and here the revaccination had been done over 30 years before. Twenty-six cases were revaccinated in the incubation period. One of those, a man aged 54, and revaccinated on the 5th day after infection, succumbed to the disease.

These 26 cases are included in the next table, where all the cases vaccinated or revaccinated in the incubation period are classified according to the day of incubation on which the vaccination was performed. If a person be successfully vaccinated within three days of infection, the disease will be almost certainly prevented. Thus, the table shows no cases in the first three days. The cases vaccinated from the 4th to the 6th day were all comparatively mild with one exception, above referred to, which was semiconfluent, and proved fatal. If vaccinated after the 6th day, even though the vaccination take well, the attack is not modified to any great extent, if at all. Sixty-seven cases of smallpox were vaccinated after the onset of illness. Of these, none were fully successful, but 4 made an abortive attempt at taking. Another feature of several of these cases was that although no vesicle ever formed after the vaccination, a red fleshy mass developed on the seat of inoculation one or two weeks after the vaccination. This was very persistent, and did not readily yield to treatment.

Three cases had been unsuccessfully revaccinated within three years of admission.

Second Attacks of Smallpox.

Three patients stated that they had had Smallpox before, but all the statements are rather unreliable, and none showed any old scars. The following are the cases in question :—

Case 118.—M. æt. 40.—An inmate of a common lodging-house.

Case 272. M.—æt. 56.—Had Smallpox when a child.

Case 379.—F. 39.—Stated that she had Smallpox 10 years ago. On fuller inquiry she admitted that it was a neighbour, and not a doctor, who told her. This case was fatal.

Evidence of Disease from Vaccination.

During the year a large number of arms have been examined after vaccination. Many of the arms, especially of those who have hard manual work to do, became highly inflamed and swollen, with enlarged axillary glands, but

with a few days' rest they got quite well. Two men who were vaccinated in the same lodging-house on successive nights developed a vaccinia general in distribution, but affecting chiefly the vaccinated arm.

Another case in West Gorton was that of a child, who was seen about a week after vaccination. It was then covered on arms, body, and legs with a rash consisting of raised red plaques, many of which were vesicular, presenting a whitish centre. There were also numerous large bullae or blisters on the arms and legs. The serum from these blisters was submitted to Professor Delépine for bacteriological examination, and was found to contain staphylococcus pyogenes, aureus and albus, and streptococci.

The house was in a dirty condition, as was also the clothing of the child. A similar rash, but very much milder in type, was seen some months later in a youth aged 16 years.

TABLE XXV.—COMPLICATIONS.

Complication		Number of Cases		Percentage
Eye	Conjunctivitis	47	56	=13·0
	Keratitis	3		
	Corneal Ulcer	1		
	Iritis	5		
Boils		48		11·1
Abscesses		5		...
Septic Sore Throat		24		5·5
Rheumatism		14		3·2
Delirium Tremens		9		2·1
Diarrhœa		6		...
Toothache		5		...
Bronchitis		4		...
Congestion of Lungs		3		...
Neuralgia		3		...
Neuritis		1		...
Oedema of Feet		1		...
Nasal Discharge		5		...
Ear Discharge		1		...
Erysipelas		2		...
Bed Sore		2		...
Miscarriage		3		...
Endocarditis		1		...
Baldness		1		...
Nephritis		1		...
Enlarged Spleen		1		...
Glossitis		1		...
Retention of Urine		1		...

The following cases, in addition to Smallpox, were also suffering from another well-marked disease at the time of admission :—

2	cases had	Scabies.
1	,,	Gonorrhœa, Soft Sore, and Syphilis.
1	,,	Enteric Fever.
3	,,	Phthisis.
3	,,	Whooping Cough.

The most numerous and most troublesome complications were eye troubles and boils. A species of septic sore throat, of an infectious nature, was prevalent in the early part of the year. All complications, but more especially boils, were most common when the wards were full. Eye complications, though frequently severe, all yielded successfully to treatment without leaving permanent damage with one exception, and here the sight of one eye was permanently impaired.

It will be observed that 13 per cent. of the cases had eye complications and 11 per cent. had boils.

The following 35 persons admitted to Clayton Vale Hospital during the year were not suffering from Smallpox :—

Children admitted along with Parents (no illness)	10
Mother taken in along with baby at the breast (no illness)	1
Bad Arms, due to Vaccination (Vaccinia).....	2
Chicken-pox (admitted as such from public institutions).....	2
Chicken-pox (admitted as (?) Smallpox)	1
Syphilis.....	1
Bromide Rash	1
(?) Menstrual Rash	4
Indefinite Anomalous Eruptions	6
Suspicious Illness	4
For Disinfection of Person and Clothing (no illness)	3
	35

All these cases were vaccinated either before or on admission, and none of them developed Smallpox.

Table XXVI.—Fatal Cases.

In the following table the various particulars of the cases which proved fatal are given in detail :—

No. of Case	Age	Sex	Type of Disease	Vaccination	Day of Disease on which death took place	Remarks
2	14 days	f.	Confluent	Unvaccinated	12th	Apparently infected *in utero*
29	54	m.	Semiconfluent	2 marks—area $\frac{3}{8}''$. Revaccinated 5th day of incubation period	7th	From Crumpsall Workhouse
82	54	m.	Confluent	3 marks (2 of them very faint)—area $\frac{3}{8}''$	11th	From Crumpsall Workhouse
89	46	m.	Confluent	2 very faint marks—area $\frac{1}{2}''$ (?)	11th	From Crumpsall Workhouse
97	64	m.	Semiconfluent	1 bad mark—area $\frac{1}{8}''$	12th	From Crumpsall Workhouse
107	10	m.	Hæmorrhagic	Unvaccinated	3rd	Patient was the only unvaccinated one of 5 children, and was the only one to develop the disease, although all were equally exposed to infection
108	52	m.	Confluent	Unvaccinated	11th	Found wandering in the street
109	35	m.	Confluent	No marks, patient delirious ; no statement	11th	Found wandering in the street in a delirious condition
142	38	f.	Hæmorrhagic	1 mark—area $\frac{1}{2}''$	6th	.....
161	73	m.	Confluent	No marks, patient delirious ; no statement	6th	.....
194	7 months	m.	Confluent	Unvaccinated	14th	.....
206	42	m.	Confluent	3 marks—area 2″	8th	.....
215	52	m.	Confluent and Sub-hæmorrhagic	Stated to be vaccinated ; no marks	13th	.....
245	60	f.	Confluent	3 marks—area $\frac{1}{4}''$	11th	After being in contact with a previous case, patient refused revaccination
268	37	f.	Confluent	Stated to be vaccinated ; no marks	17th	.....
284	44	f.	Confluent and Sub-hæmorrhagic	2 bad marks—area $\frac{1}{4}''$	14th	.....
289	60	m.	Semiconfluent	4 marks—area $\frac{1}{2}''$	29th	Also suffered from Tuberculosis (?)
305	53	m.	Hæmorrhagic	1 mark—area $\frac{1}{8}''$	5th	From Prestwich Union Workhouse
308	44	m.	Confluent and Sub-hæmorrhagic	2 marks—area $\frac{1}{2}''$	10th	From Prestwich Union Workhouse
313	74	m.	Semiconfluent	No marks ; no statement	14th	From Prestwich Union Workhouse
316	75	m.	Confluent	1 mark—area $\frac{3}{16}''$	13th	From Prestwich Union Workhouse
332	26	m.	Confluent	Unvaccinated	14th	.....
379	39	f.	Confluent	1 mark—area $\frac{3}{8}''$	9th	After contact with a previous case, patient refused revaccination
385a	12 hours	m.	Discrete	Vaccinated soon after birth	14th	Infected *in utero*
410	8	m.	Confluent and Sub-hæmorrhagic	Unvaccinated	16th	.....

Hæmorrhagic cases (Purpura Variolosa) were three in number, and all were fatal, death occurring within six days of onset. In the other cases, death, as a rule occurred from the 10th to the 14th day. One case lingered until the 29th day, but appeared to be also suffering from Tuberculosis. Of the 25 deaths, 13 had been vaccinated in infancy, 6 were unvaccinated, in 5 the vaccination was doubtful, and 1 was vaccinated in the incubation period only. The fatal cases include two children infected *in utero*, who were too feeble to offer any substantial resistance to the disease, and also 8 old and enfeebled paupers from the workhouses. There was also another fatal case over 70 years of age. Notwithstanding the inclusion of these cases, the case fatality for all cases treated in hospital was only 5·8 per cent., which shows that, on the whole, the type of disease was a mild one.

Staff.

All the nurses and wardmaids, and also the medical attendants, were revaccinated before commencing duty at the hospital. Although all these, but more especially the nurses, are in frequent and close contact with the patients, attending to their dressing, etc., none were infected with the disease.

The Sanitary Inspectors and the regular staff at the disinfecting station were also revaccinated, and none of them developed Smallpox during the year.

JAMES M. COWIE, M.D.

SCARLET FEVER.

The following are the tables relating to the occurrence of this disease at different periods of the year and in the different sanitary districts of the City, and to its severity in districts and at different ages.

They show (Table 1) that the weekly incidence of cases pursued the usual course, except that the weekly numbers rapidly fell off in December, while the total numbers reported in the last quarter of the year was lower than in the first, indicating the commencement of a decline in the long period wave.

From Table 2 we find that the attack rate was lower than in any of the last three years, and was much lower in the Manchester Township than in either of the other two divisions of the City.

Table 3 shows the attack rate, case fatality per cent., and removal to Hospital per cent. for each of the Sanitary Districts of the City. The death-rate may be obtained by multiplying the attack rate into the case fatality.

We perceive that the attack rate, the case fatality, and the total death-rate were, none of them, in direct relation to the proportion removed to the Hospital.

The highest death-rates occurred in Blackley, Harpurhey, and Beswick.

Table 4 exhibits clearly the decline in fatality with each succeeding year of life up to 10.

From Table 5 we see that the total death-rate from Scarlet Fever was lower than in any of the last three years, and was considerably the lowest in the Manchester Township.

TABLE 1.

SCARLET FEVER, 1903.—ATTACKS IN WEEKS ACCORDING TO DATE OF RASH.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 10	58	April 11	32	July 11	32	Oct. 10	49
,, 17	50	,, 18	22	,, 18	42	,, 17	44
,, 24	61	,, 25	33	,, 25	38	,, 24	46
,, 31	52	May 2	42	Aug. 1	28	,, 31	52
Feb. 7	43	,, 9	37	,, 8	32	Nov. 7	35
,, 14	33	,, 16	53	,, 15	27	,, 14	35
,, 21	44	,, 23	36	,, 22	27	,, 21	36
,, 28	47	,, 30	40	,, 29	34	,, 28	39
Mch. 7	38	June 6	45	Sept. 5	41	Dec. 5	32
,, 14	30	,, 13	43	,, 12	33	,, 12	34
,, 21	34	,, 20	24	,, 19	39	,, 19	29
,, 28	35	,, 27	44	,, 26	61	,, 26	26
April 4	40	July 4	33	Oct. 3	39	Jan. 2	33
Total...	565	Total...	484	Total...	473	Total...	490

City Total, 2,012.

TABLE 2.

SCARLET FEVER ATTACKS, 1903.—RATES PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1898	1899	1900	1901	1902	Mean	1903
Twelve Towns *	3·51	5·10	4·82	5·07	5·80	**4·86**	4·34
City of Manchester	1·66	2·69	4·62	4·93	4·15	**3·61**	3·63
Manchester Township	1·16	2·27	3·49	3·66	3·07	**2·73**	3·18
North Manchester	1·77	4·07	5·85	5·30	5·09	**4·42**	4·27
South Manchester	1·88	2·12	4·44	5·37	4·09	**3·58**	3·43

* These are Blackburn, Bolton, Bradford, Burnley, Huddersfield, Hull, Leeds, Liverpool, Oldham, Preston, Salford, and Sheffield.

Table 3.

1903—Scarlet Fever Attacks in Districts, with Attack Rate, Case Fatality per cent., and Removals to Hospital per cent.

Districts	Attacks	Attack Rate per 1,000 Living	† Case Fatality per cent.	Removals to Hospital per cent.
Ancoats	88	1·98	4·55	92·2
Central	49	1·72	4·08	87·8
St. George's	283	4·78	3·89	92·6
Cheetham	195	5·03	2·05	79·5
Crumpsall	34	3·76	5·88	73·5
Blackley	23	2·51	21·74	69·6
Harpurhey	96	5·39	6·26	79·3
Moston	57	4·00	3·51	63·1
Newton Heath	146	3·93	5·48	84·3
Bradford	90	3·70	6·67	90·0
Beswick	75	6·26	5·33	98·7
Clayton	19	1·94	5·26	73·7
Ardwick	148	3·47	5·41	81·8
Openshaw	85	3·05	3·53	81·3
Gorton (West)	131	4·32	3·82	88·6
Rusholme and Kirk	97	3·80	1·03	60·9
Chorlton-on-Medlock	217	3·78	5·07	79·7
Hulme	179	2·71	6·70	87·1
City of Manchester	**2012**	**3·63**	**4·72**	**83·4**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

Table 4.

Scarlet Fever.—Number of attacks, of deaths, and case fatality per cent. at different ages, for the ten years 1893-1902, and for 1903.

Ages	1893-1902			1903		
	Attacks	Deaths	Case Fatality per cent.	Attacks	Deaths	Case Fatality per cent.
Under one year ...	267	57	21·4	19	4	21·1
1 to 2 years ...	781	141	18·0	73	5	6·8
2 to 3 ,, ...	1,477	213	14·4	138	16	11·6
3 to 4 ,, ...	1,974	225	11·4	157	16	10·2
4 to 5 ,, ...	2,218	195	8·8	185	22	11·9
5 to 6 ,, ...	2,163	104	4·8	215	8	3·7
6 to 7 ,, ...	1,941	77	4·0	210	2	1·0
7 to 8 ,, ...	1,751	53	3·0	196	7	3·6
8 to 9 ,, ...	1,376	26	1·9	163	2	1·2
9 to 10 ,, ...	1,165	21	1·8	138	2	1·5
10 to 15 ,, ...	3,408	55	1·6	325	5	1·5
15 to 20 ,, ...	1,060	28	2·6	100	3	3·0
20 to 25 ,, ...	485	11	2·3	50	1	2·0
25 to 35 ,, ...	391	9	2·3	32	1	3·1
35 to 45 ,, ...	95	2	2·1	8	1	12·5
45 to 55 ,, ...	31	1	3·2	2	...	...
55 to 65 ,, ...	4	...	...	1	...	...
Over 65 ,, ...	...	...	...	...	...	...
All Ages	20,587	1,218	5·9	2,012	95	4·72

Table 5.

Scarlet Fever Mortality, 1903.—Rate per 1000 living, compared with mean of five years.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales.....	0·11	0·12	0·11	0·13	0·19	**0·13**	0·12
*76 Great Towns	0·14	0·13	0·13	0·17	0·19	**0·15**	0·14
London.....	0·13	0·09	0·08	0·13	0·12	**0·11**	0·08
Manchester City.....	0·12	0·08	0·19	0·23	0·27	**0·18**	0·17
Manchester Township	0·11	0·08	0·16	0·24	0·21	**0·16**	0·14
North Manchester	0·12	0·09	0·24	0·25	0·31	**0·20**	0·21
South Manchester	0·12	0·09	0·18	0·22	0·26	**0·17**	0·17
*103 Smaller Towns	0·10	0·12	0·12	0·14	0·14	**0·14**	0·12
Rural Districts.....	0·09	0·10	0·10	0·10	0·10	**0·10**	0·10

*The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns.

The number of deaths from this disease in 1903 was 97, as compared with 397 from Measles. It is not to be inferred that it is of slight importance in consequence.

A great reduction in the mortality from Scarlet Fever has been in progress for many years, as is at once seen by the following figures, taken from the Annual Report of the Registrar-General for 1901.

Annual death-rates from Scarlet Fever and Measles in a million persons living in groups of years 1866–1900. :—

Causes of Death	1866-70	1871-75	1876-80	1881-85	1886-90	1891-95	1896 to 1900
Scarlet Fever	959·8	758·6	679·6	435·8	240·6	182·2	134·6
Measles	428·4	373·2	384·8	413 0	468·4	407·2	421·0

We thus see that although the death rate from Measles is now three times that of Scarlet Fever, in 1866–70 it was one-half.

There has been practically no alteration in the Measles death-rate.

In face of the general reduction in the death-rates from individual infectious diseases, it is certainly strange that Measles should have stood still. It is probable that, starting at a period when Scarlet Fever as a disease was more formidable than it now is, many deaths were registered as Scarlet Fever which ought to have been registered as Measles.

But the reduction in the death-rate of the two combined is very great.

Scarlet Fever alone was seven times as fatal in the first period as now.

The chief cause of this great reduction in mortality is, undoubtedly, the milder character of the disease.

But it is probable that other factors have been at work also.

The first factor worthy of mention is the transfer of deaths. It is possible that a considerable number of deaths were transferred from the severest types of Measles and Smallpox, although, on the other hand, there may have been a transfer from Scarlet Fever to Diphtheria. The severity of Scarlet Fever is dependent to no small extent on the condition of nutrition of the children attacked, and it is known that in the early quinquennia distress was widespread. The attention which has been bestowed by Medical Science on this

class of disease, and on the sequelae, has also no doubt had something to do with the result, as has the action taken by Health Authorities in tracing its sources and in cutting off avenues of infection.

The housing of the poorer classes has greatly improved. All these factors have no doubt contributed to the change. Yet, whether as a consequence or as part of a long periodic wave, the most conspicuous feature is the change of type.

So far as public health work is concerned, the important feature to note is that Scarlet Fever is a disease capable of assuming a more malignant aspect than it now presents, and of causing a high mortality. We are thus restrained from claiming the improvement in its mortality as our handiwork, but we are also constrained to watch it with close attention. Like Measles, it is liable to leave formidable sequelae behind it of a permanent character. The most important of these are ear disease, with consequent deafness and liability to fatal brain disease, and heart disease. Still, it can hardly be maintained that in the aggregate the consequent diseases are so fatal as those following on Measles.

Superimposed on the main curve of its epidemic course are a number of smaller waves, so that we can anticipate, with some degree of confidence, not the exact number of cases in one year, but whether there will be more or fewer than in the preceding year.

Thus, referring to the first of the usual tables under infectious diseases, we see that successive waves culminated in 1896 and 1901, that is to say, at an interval of five years. The year 1903 should thus be in the trough of the wave, and we may now anticipate an increase.

But the preceding wave as measured by the distance between years of minimum incidence was of longer duration than five years, or else there was some impediment to notification, as may very well have been the case about the year 1891. The most common wave period is five years.

In addition to the above wave, which we may call quinquennial for the sake of clearness, there is also an annual wave, which generally possesses the same features from year to year. It is especially liable to alter its character or to miss, in the trough and on the crest of the wave.

The seasonal wave is generally marked by an increase of cases in the third and fourth quarters. Usually the number of cases is fewest in the second quarter. Last year the number was highest in the first quarter, as is liable to happen with a descending quinquennial wave. It is also liable to happen when the increase in the last half of the year preceding has been exceptionally high.

The general features of the annual wave are well seen on page 74 of the Annual Report for 1901.

Corresponding with the marked increase of cases in the third and fourth quarters there is often a diminished fatality, which one has been inclined to suppose may be in connection with growth of the specific organism outside the body. Untraced cases of Scarlet Fever have been shown to have a closer connection with defective pail closets than the other common zymotic diseases except, perhaps, Enteric. The urine in Scarlet Fever probably contains the specific organism from a comparatively early period, and the processes of cleansing pail closets as well as their frequent defects offer special facilities for the spread of Scarlet Fever by these means, especially in confined back areas.

The suggestion, then, is that summer is favourable to the external multiplication and diffusion of the infective micro-organism of Scarlet Fever, and that the increase in numbers in the autumn as well as the diminished fatality are both due to the importation into the broad common stream of infection of accessory courses from external growth.

It would appear from observation that the micro-organism of Enteric Fever can multiply in the soil under favourable conditions, and Scarlet Fever has this in common with Enteric, that the infection apparently multiplies in milk. It is very unlikely that, while the bacillus of Enteric Fever can grow freely on potatoes, in broth, in milk, and in organic liquids generally, the external life of the Scarlatinal infection is confined to milk.

Have we, perchance, in the enormous improvements which have taken place in the disposal of excreta, a clue to the great reduction in the fatality of Scarlet Fever. It is quite possible that this factor has had a considerable share in the result.

That weather does in some manner affect the incidence of Scarlet Fever appears to be clearly shown by a study of the number of cases and deaths occurring in successive years given on pages 76 to 79 of the Annual Report for 1901.

In his work entitled Studies in Statistics, Dr. Longstaff shows that when the rainfall is exhibited side by side with a curve of the deathrate from Scarlet Fever for England and Wales in each of the years 1865–1880, there is a well maintained correspondence between diminution of rainfall and excess of Scarlatinal mortality. This is not borne out, however, by the curves for the succeeding ten years.

If, however, a high rainfall depresses Scarlatinal mortality, one would expect that this effect would be specially well marked in the third quarters of the respective years, since it is in that quarter that signs are exhibited most plainly of the effect of extraneous influences on the annual wave.

The following are the figures :—

	1891	1892	1893	1894	1895	1896
Rainfall—Oldham Road, Third Quarter	in. 12·79	in. 12·49	in. 10·69	in. 9·02	in. 11·17	in. 9·73
Deaths from Scarlet Fever, Third Quarter	18	33	24	36	47	50
Deaths, Fourth Quarter	29	34	33	32	58	42
	1897	1898	1899	1900	1901	
Rainfall—Oldham Road, Third Quarter	in. 9·70	in. 6·06	in. 8·65	in. 9·57	in. 6·49	
Deaths from Scarlet Fever, Third Quarter	29	16	10	23	37	
Deaths, Fourth Quarter	48	12	19	30	28	

These figures show that whether the influence of rainfall in the third quarter is direct or indirect, and whether we should expect it to be manifest in the third or fourth quarters of the year, there is evidently no correspondence between high rainfall and low death-rate, but rather the contrary.

This may be put in other terms thus. If we look only to those periods of the year in which weather may be expected to have an important influence on the Scarlatinal mortality, by its effect on the growth of infective matter outside the body, a low rainfall in Manchester is not associated with a high Scarlatinal mortality, though the reverse also is not true. The subject requires more detailed examination, but it is questionable how far it would repay it, since the quinquennial wave may be expected to obscure the influence of season.

If in the same manner we compare the rainfall year by year with Scarlatinal death-rates and incidence rates we find that there is no correspondence manifest between total rainfall and either increase or decrease of Scarlet Fever incidence or mortality.

Year	Rainfall	Scarlatinal Mortality	Scarlatinal Death-rates	Scarlatinal Incidence Rates
1891... ...	38·028	101	0·22	2·24
1892... ...	38·548	143	0·27	3·25
1893... ...	30·328	133	0·27	3·92
1894... ...	36·294	115	0·22	4·27
1895... ...	33·875	176	0·33	4·37
1896... ...	33·778	195	0·37	4·42
1897... ...	35·891	130	0·23	3·34
1898... ...	29·824	59	0·12	1·66
1899... ...	30·837	44	0·08	2·69
1900... ...	36·818	103	0·19	4·62
1901... ...	29·544	127	0·23	4·93
1902... ...	26·509	146	0·27	4·15
1903... ...	38·703	97	0·17	3·63

The direct transmission of the disease from person to person is probably the largest factor in the spread of Scarlet Fever.

There can be little doubt that the infection is usually given off by the infecting individual in person, and it is a question of very considerable moment from what portion of the body infection is derived.

It is becoming rapidly an article of faith that infection is derived from the mouth and nostrils, and not from the skin

Certainly, if Scarlet Fever is conveyed chiefly by such discharges, it should not be a difficult matter to prevent infection.

But this is by no means certain, and it is also upon the whole improbable.

Clothing worn by a child who has suffered from Scarlet Fever is well known to be infectious, and frequently to remain so for a prolonged period if shut off from light and free access of air.

The point is one of considerable practical importance. It may be true that after the fourth week or so the matter peeling from the skin is comparatively free from germs, and feeble in infective power. But so is the matter on a smallpox case, and so, also, are, under normal circumstances, the discharges from the ear and nose, in the later stages of Scarlet Fever.

It is, I think, probable that the infection is discharged from the skin as in smallpox, especially in the earlier stage of the disease.

It is highly probable that in very severe cases infection is discharged with the fæces, and it may almost be regarded as certain that the infective matter comes away in the urine, judging from the analogy of Enteric Fever.

It will be seen from these observations that, although I do not regard cases of Scarlet Fever as being of high potency for infection after the first four weeks, I believe that in a certain proportion of cases the matters cast off from the skin are infectious, and I do not think that, as a rule, children attacked should be allowed to mingle with others not as yet infected until desquamation has practically ceased. Probably six weeks would be the average period.

We do not as yet know definitely what is the micro-organism causing Scarlet Fever. Klein and M. H. Gordon are inclined to believe that the micro-organism which they name Streptococous Conglomeratus is the *vera causa*, and Dr. Klein believes also that he has proved that Scarlet Fever may occur spontaneously in the cow, and so be transmitted by means of milk.

Now, it is quite certain that the micro-organism which causes Scarlet Fever must be minute. Yet it cannot be easily detached and scattered singly. Scarlet Fever does not spread rapidly in school. It may reach considerable proportions in one department of a school, yet not spread to another having a separate playground and offices. It does not spread aerially from Scarlet Fever Wards to others in the same grounds.

Hence the infective germ is contained only in the discharges, or it is aggregated in the skin in clumps, and in fact in any case it must be comparatively heavy, which it can only be by cohesion of a number of germs.

If we do not believe this we are bound to accept that it perishes readily, which is quite incompatible with the histories of Scarlatina-infected clothing.

Why does it survive so long in clothing? Does it retain its vitality because woollens are hygroscopic and retain moisture, or does it actually multiply in clothing under certain conditions? To this question no certain answer can be given, but the latter supposition is at least a possible one.

Return cases cannot well be due to anything other than the storage of infection in the nasal cavities or crypts of the tonsils, and the distance of time after discharge at which infection sometimes occurs appears to show either great tenacity of life on the part of the individual micro-organisms or that they may multiply in their hiding places.

The facts of Enteric Fever go to show that when the system is rendered immune after an attack the bacilli retained are not, therefore, destroyed, but are eliminated in a viable condition after a considerable lapse of time.

If we are to accept this as unconditionally applicable to Scarlet Fever, we should have also to accept that cases kept at home are in their due proportion infectious after discharge, just as are those cases discharged from hospital which cause return cases.

The facts at our disposal do not warrant this view. They are sufficiently concordant year by year.

After discharge of Scarlet Fever patients from the hospital, in a certain proportion of instances, subsequent cases occur in the same family. These are more numerous the nearer the subsequent cases are to the time of discharge. There is, practically, absence of subsequent cases previous to discharge. There is no corresponding occurrence of cases when patients are kept at home and subsequently allowed to mingle with other members of the family, although there remains in the households a considerable number of susceptible persons.

The inference is that return cases constitute a hospital phenomenon, and are not due to anything incidental to the disease itself.

If the facts be as our records represent, whatever bacteriology may suggest, the conclusion is irresistible that return cases are due to the accumulation in the nasal cavity and throats of patients treated in the hospital of infective matter from other patients. But there is always the difficulty that there may be some weak point in the facts themselves. The only source of fallacy which I can see is that when subsequent cases occur at home after discharge of a case which has been isolated, they are not always reported, so as to save trouble.

This is a possibility, but it cannot be regarded as probable, and, in any case, it is a possibility which cannot be put to the proof. It is also a possibility equally applicable to return cases.

It appears worth while again to examine the records, with a view to see whether there is anything in the history of patients treated outside the hospital corresponding to the occurrence of return cases in connection with cases treated in the hospital.

In the report for 1901 an examination was made into the occurrence of subsequent known cases at home, after a primary case had been removed to the hospital, and when the case was treated at home, and it was shown that removal to hospital does avert much disease from the household.

This may safely be inferred when we remember that cases treated in hospital come, on the average, from poorer and more crowded houses than do cases treated at home.

It appears desirable, however, to repeat these examinations so that we may see how far the experience of another year will bear out that of 1901.

It has been alleged against treatment in hospital that by the occurrence of return cases the disease is kept alive in the district, that these cases are more severe than the average case, and that the children are also subject to other infections in hospital, that the mortality from the disease is not thereby reduced, and that, in the aggregate, hospital treatment in the case of Scarlet Fever does no good, but rather harm.

Were this a true statement of the facts, we should expect that the incidence-rate and the death-rates from Scarlet Fever would be highest in those districts from which the largest percentage of removals occur. As a matter of fact, the incidence-rate is comparatively low in the Manchester Township, which sends considerably the highest proportion of cases to the hospital, taking the ten years 1891–1900.

For the same period, on the other hand, the death-rate was somewhat higher in this district than in the other two.

But it was only slightly higher, a fact which corroborates the lower incidence, since the children are of a much poorer class, and suffer a much higher case fatality than children from other parts of the City.

These figures are more striking when examined in detail. The percentage of cases removed to hospital from the Manchester Township, and from the whole City year by year, are as follows, also the death-rates from Scarlet Fever :—

Scarlet Fever.

		1891	1892	1893	1894	1895	1896	1897
Manchester Township.	Removal to Hospital, per cent.	72·3	71·1	76·3	79·1	82·0	83·5	89·2
	Death-rate per 1,000 ...	0·22	0·35	0·23	0·26	0·37	0·41	0·27
City.	Removal to Hospital, per cent.	61·1	58·5	58·6	66·0	71·3	73·9	79·7
	Death-rate per 1,000 ...	0·22	0·27	0·27	0·22	0·33	0·37	0·23
		1898	1899	1900	1901	1902	1903	
Manchester Township.	Removal to Hospital, per cent.	85·8	87·2	88·0	88·5	88·8	91·9	...
	Death-rate per 1,000 ...	0·11	0·08	0·16	0·24	0·21	0·14	...
City.	Removal to Hospital, per cent.	73·1	74·4	80·9	82·3	81·2	83·4	...
	Death-rate per 1,000 ...	0·12	0·08	0·19	0·23	0·27	0·17	...

We perceive that the percentage of removals from the Manchester Township took on a marked increase in 1897, and those for the whole City in 1900, the percentage for the whole City being always, however, considerably lower than for the Manchester Township.

From 1891 to 1895 the percentage from the Manchester Township was lower than the percentage in 1903 from the whole City.

The slight excess in the death-rate from the Manchester Township is entirely confined to the earlier years, and ceases in 1897, after which year the death-rate is steadily below that of North Manchester, and in five out of the seven years below that of South Manchester.

It is difficult to reconcile these figures with an unfavourable influence from hospital treatment on the incidence or mortality.

Corresponding also to the higher percentage of removals, the annual rate of attacks per 1,000 of population is generally much lower in the Manchester Township than in the other two divisions of the City.

This may, of course, be due to other causes, but the only apparent relation which at all accounts for the figures is the higher percentage of removals from the Manchester Township.

When we consider how great an influence the state of nutrition of the child attacked exerts on fatality, these figures are certainly very striking.

I shall, however, discuss the subject from another point of view.

Progression of Scarlet Fever in Districts.

In the report for the year 1901, it was shown that the rate of progression is much slower than that of measles, and that the interval between the troughs of the waves in most districts was, during the years 1891–1901, seven years.

It appeared also that the disease does not readily extend from one district to another.

To this difficulty in extending the chief contributing factors are—

1. The disease is only actively infectious, as a rule, after acute symptoms have set in, and, indeed, after the eruption has appeared. By this time a large proportion of the cases have been isolated. The history of overlooked cases shows that this is a potent factor.

The Public Health administration has greatly contributed towards rendering this factor operative.

2. The removal of a large proportion of cases to the Fever Hospital may have some effect.

3. The short striking distance of Scarlet Fever.

But the first factor is undoubtedly the most powerful.

We are now in a position to measure the distance in point of time between the crests of the last two waves, which for the whole City is five years.

When, however, we proceed to do this for different districts the periods between successive crests are strikingly irregular, and there is but little correspondence in point of time between adjoining districts. The distances between successive crests varies from two to eight years. There is a tendency for the crest to last two years in this form  Sometimes it lasts four years. All this shows the slow rate of travel.

Schools contribute to the propagation of Scarlet Fever, but in a much smaller degree than Measles.

When a primary case has been overlooked, the course of subsequent events is so different from that holding when the case has been recognised that, in a study of hospital influence, it is placed in a separate category, and the subsequent cases are included in this list, whether the primary and secondary have been removed to hospital or not.

Clearly separate treatment is necessary, since on the one hand Hospital treatment could have practically no influence on these cases or on the consequences arising from them, and on the other it would be unfair to credit the Hospital with the subsequent infections.

Cases occurring after return of a patient discharged from the Hospital are also treated separately, and all subsequent cases are assigned to these or treated as themselves return cases.

These must be debited to the Hospital. It is remarkable how slight is the amount of return infection outside the home. When we remember in how small a proportion we definitely ascertain the source of infection, not exceeding one-tenth of the total, it may be considered not improbable that the external returns are more numerous than they seem to be. Yet it cannot be doubted that the number of persons infected by discharged patients is small compared with the number infected at home.

Further consideration of Hospital Influence.

I have carefully examined every sheet relating to Scarlet Fever, and classified those occurring in private houses according as they were the first cases ascertained in the house, or subsequent cases.

These have been further subdivided into primary cases removed to Hospital, and primary cases treated at home.

The number of persons under 15 other than the primary cases known not to have had the disease has been excerpted for each household, and also the total number believed not to have been previously infected. The latter figure is of course much less reliable than the former.

Number of primary cases occurring at home, removed to Monsall, in successive groups	Number of susceptible persons under 15 years of age left in the house	Total number left	House-holds having sub-sequent cases	Number of sub-sequent cases	Number of subsequent cases occurring within — days of removal of first case							Return cases at home	
					Within 8 days	— 14	— 21	— 31	— 41	42 and upwards	Period unknown	Within 21 days after discharge	21 days and upwards
Removed to Monsall, 1903...1,147	2,103	4,789	138	172	134	19	8	4	6	1	...	78	26
Nursed at home, 1903..... 215	209	626	20	21	12	3	3	0	2	1	...	...	...
Overlooked, 1903..... 105	208	459	108	188	52	22	15	9	4	0	86	...	...
Removed to Monsall, 1901...1,534	2,937	7,813	334	462	279	33	17	12	6	8	...	68	38
Nursed at home, 1901..... 358	351	1,484	52	69	52	14	3	4	1	0	...	...	...
Overlooked, 1901..... 109	223	564	67	100	57	26	12	4	0	1	...	...	...

The number of subsequent cases, with the distance in time after removal of the primary to the Hospital has been recorded, and, in the case of those treated at home, with the distance in time after the occurrence of eruption (or illness where there was no eruption) in the primary case.

These give figures not strictly, but nearly, comparable, as we may take it that cases are removed to the Hospital, on an average, two days after the eruption has appeared.

When a subsequent series of cases has occurred, the distances in time are reckoned, not from the first eruption, but from the date of the eruption in the last case occurring.

Hence when, after the removal of a case to the Hospital, we find cases occurring 13, 20, or 30 days after removal, this means that infective matter has remained in the house, or that some subsequent case has been overlooked, or that there has been re-infection of the household.

The figures relating to primary cases removed to Hospital or treated at home, and to overlooked cases, are accompanied by the corresponding figures for 1901, with a view to comparison.

A material difference is shown in respect of the overlooked cases between 1901 and 1903, due to the fact that in the former year when cases have occurred nearly simultaneously in one house they have been treated as primary and secondary, while in 1903 they have been put down to unknown overlooked cases.

The exact amount of this difference is shown, however, as 86 cases, and on subtracting these from the total of 188 subsequent cases we see that there were, in 1903, 102 subsequent cases as compared with 100 in 1901, a considerably higher proportion.

This will render the number of primary cases in 1901 too high in a comparison, say, by 40, and the number of subsequent cases to primary recognised cases occurring within 8 days too high, say, by 46.

There were also, in 1903, 105 primary overlooked cases ascertained, as compared with 109 in 1901, a much higher figure relatively to the total. It is impossible to say to what this increase in overlooked cases is due.

We perceive also that the number of subsequent cases occurring in 1903 in the house beyond eight days after the removal of a primary case was 38, as compared with 134 occurring within eight days of removal; whereas, in 1901, the number of cases beyond eight days was 76, as compared with 279 within eight days of removal.

In both years, however, the number of cases occurring after 21 days, when patients have been nursed at home and isolated, is comparatively small, viz., three in 1903 out of a total of 191 susceptible under 15, and five in 1901 out of a total of 287 susceptible under 15.

For cases removed to the hospital we have, including return cases, in 1901, 132 subsequent infections occurring out of a total of 2,501 susceptible, beyond 21 days after removal of the primary case, and in 1903, 107 out of a total of 1,942.

In both years, therefore, the proportion of cases occurring in the household to susceptible persons, beyond 21 days after removal of the primary case, is considerably higher in the case of the hospital than in the case of patients treated at home, though, if return cases are excluded, the reverse is the case.

This is an illustration of the position that return cases constitute a hospital phenomenon, but it is scarcely needful to push this matter, as the evidence adduced in previous reports appears conclusive.

I give, however, the facts of return cases for 1903, arranged as in previous reports according to the distance of their eruptions from those of primary cases, and also from the discharge of the presumed source of infection from the hospital.

Cases occurring at home after the return of a previous case from hospital :—

No. of Days After Eruption in First Case.

28 —	35 —	42 —	49 —	56 —	63 —	70 —	77 —	84 —	91 —	98 —	105—	112—	119†-	Total Cases
1	...	6	8	9	19	13	8	5	8	7	7	2	11	104

Days After the Return Home of Primary Case.

— 7	— 14	— 21	— 31	— 41	— 51	— 61	— 71	Total
24	36	18	15	6	1	2	2	104

Of the above, 96 occurred in separate households, and it is possible that 14 received the infection from the first case attacked after the discharge of the primary case.

The following are the facts of return cases external to the home. There is, naturally, not the same degree of probability attaching to their source of infection :—

No. of Days After Eruption in First Case.

28 —	35 —	42 —	49 —	56 —	63 —	70 —	77 —	84 —	91 —	98 —	105—	112—	119†-	Total
...	...	...	2	1	2	1	4	2	...	...	...	...	1	13

DAYS AFTER THE RETURN HOME OF PRIMARY CASE.

— 7	— 14	— 21	— 31	— 41	— 51	— 61	— 71	Total
2	4	2	4	1	...	...	...	13

The comparatively small number occurring external to the home is, no doubt, mainly due to the circumstance that the person infected by the case discharged has apparently to be in very intimate relation with that case before infection occurs. That is to say, the two sleep in the same bed, one nurses the other, and so forth.

The total return cases were distributed in ages as follows, and the undermentioned deaths ocurrred, also distributed in ages :—

	0—4	5—	10—	15—	20—	25—	35—	Over 45	Total
Cases	43	53	11	5	2	2	...	1	117
Deaths	3	3	...	...	...	...	...	...	6

For every case full particulars are recorded for several years of the complications during stay in hospital, and subsequently of the primary cases (see Report for 1901).

The Report for 1901 may be analysed as follows :—

COMPLICATIONS OF PRIMARY CASES IN HOSPITAL, 1901.

None	Rhinitis	Otorrhœa and no Nasal Discharge	Other Complications without Nasal Discharge or Otorrhœa, mostly Nephritis
51	54	10	13

Although there are more cases having nasal discharge than are free from complications, this, perhaps, does not mean very much, as Rhinitis, in some degree, is exceedingly prevalent.

The corresponding facts for 1903, which are not printed in full, to save expense, when analysed give these results :—

COMPLICATIONS OF PRIMARY CASES IN HOSPITAL, 1903.

None	Rhinitis	Otorrhœa and no Nasal Discharge	Other Complications without Nasal Discharge or Otorrhœa, mostly Nephritis
45	18	22	8

It appears to me, in face of the accumulation of facts given in successive reports, that I must maintain the position that the infection of return cases is,

almost certainly, not due to the remanent power of infection in the discharged case, but to the foreign strains of infection which they have accumulated in the hospital.

It is not intended thereby to deny the possibility of the organism causing the disease originally in the discharged person remaining viable in the nostrils or elsewhere, but it is strongly suggested that the foreign Scarlatinal germs stored in the nasal cavities during stay in the acute ward retain a higher pathogenicity than do those peculiar to the patient.

In any case, the same precautions are indicated.

A study of the individual facts seems to show that the discharged cases potent for further infection tend to occur in groups.

Returning now to the question of the influence which the Hospital exerts on the course of the disease, we must admit that there will always remain in the overlooked attacks a large nucleus of cases not reachable by isolation.

Of these in 1903 there were no fewer than 105 ascertained, while 102 subsequent cases were ascribed to these, and 188 were believed to be due in all to overlooked attacks. We perceive also that out of the 102 subsequent cases due to the 105 primarily overlooked, only 52 occurred within 8 days, while 50 occurred at later periods, and were freely extended up to 41 days. At the end of this period there were still 96 remaining susceptible under 15 years of age, but none developed the disease.

In 1901 there were 123 remaining, of whom 1 developed an attack.

There was thus one attack out of 219 susceptible persons remaining after 41 days, a great contrast to the Hospital experience.

These were, however, slight cases, and we thus see that, even with slight cases, it is not safe to isolate for a shorter period than six weeks.

The experience of cases nursed at home emphasises the same point, though not so clearly.

The facts pertaining to overlooked cases seem to throw further light on the subject.

In 1901 57 of the subsequent cases occurred within 8 days of the primary overlooked attack out of a total of 100 subsequent cases, while in 1903 the corresponding figure was 52 out of a total of 112.

Now, supposing all the primary cases removed to Hospital had been treated at home, we may be quite certain that the proportion of subsequent cases occurring within 8 days would not have been so high as in the overlooked cases.

Supposing, however, that proportion had reached 50 per cent., then, in 1901, we should have had 134 cases occurring at home after 8 days, instead of the 38 which actually occurred. The limit of saving at home due to the Hospital may thus be put at 96 cases. In 1901 the limit would thus be placed at the same figure, viz., 96 cases.

Against this must be placed the number of return cases at home, and of cases dependent on them. In 1901 this number was 106, and in 1903 96 cases.

We must conclude that the Hospital shows no saving so far as infection in the same house is concerned.

When we come to consider what would occur outside the home, however, we see that the balance is here decidedly in favour of the Hospital. While it may be admitted that patients discharged from a private house are probably less dangerous to other children than patients discharged from the Hospital, if properly isolated for a sufficient period, it is quite certain that they would, in many instances, not be so isolated, and that much more infection would occur in the poorer districts than is now the case.

It is in the diminution of this external infection that we may find an explanation of the lessened incidence and total mortality in the Manchester Township generally, and in its separate districts.

The conclusion of the matter appears to be this, that it is desirable, as heretofore, to remove cases from poor or crowded households, from shops, and where the workers are engaged in occupations which require special care, but that removal to Hospital should not be pressed where patients can be suitably isolated and treated at home for a sufficient length of time.

The fatality of cases treated in Hospital was, in 1903, almost precisely the same as that of cases treated at home, which speaks highly for the treatment pursued.

The facts relating to known sources of infection of Scarlet Fever at home are as follows :—

Cases contracted at home after the occurrence of a primary notified case, including return cases, 172.

Cases due to overlooked cases at home ascertained, 21.

Cases due to overlooked cases at home not ascertained, 102.

Total return cases, 104.

On a careful consideration of the records of cases of Scarlet Fever occurring in schools, it appears probable that the disease was spread in school in 28 instances.

The schools most seriously affected were :—

St. Oswald's, Church of England School		...Forrest Street
Albert Memorial	do.	...Queen's Road
Christ Church	do.	...Harpurhey
St. Stephen's	do.	...Chorlton-on-Medlock.
Queen Street School		.....Bradford
Birley Street School		.....Beswick

Cases in which other Possible Sources of Infection have been Ascertained.

I have not considered it necessary to give the full history of infection in cases contracted elsewhere than at home, or having a doubtful origin, but the following are of some interest :—

177. Case of Scarlet Fever in house of workmates.

268. Father is employed in building alterations at Monsall Fever Hospital.

492. Child from an infected house slept with this patient and was subsequently reported as having Scarlet Fever.

528. Three workmates have had sore throat.

616. Workmate removed with Scarlet Fever two weeks before.

838. Clothing brought here from an infected house to be mangled.

856. Visited house from which two Scarlet Fever patients were removed seven days previous.

In 14 instances some other member of the family had had a suspicious illness, such as sore throat, measles, tonsillitis, etc.

Eight patients had been in contact with some person, apparently well, yet coming from an infected house.

Thirty cases were recorded of playmates having had Scarlet Fever or a suspicious illness.

In 12 cases Scarlet Fever was present in the adjoining house, or in a house in the same street, but direct contact had not been proved.

Previous cases of Scarlet Fever had occurred in the same household within these periods before the attack :—

3-5 months.	6-11 months.	12-17 months.	18-23 months.	24-29 months.
— ...	7 ...	2 ...	3 ...	7

DIPHTHERIA AND MEMBRANOUS CROUP.

The seasonal incidence of Diphtheria varies considerably. Table A, in the first column, gives the percentages of the total number of cases for 11 years, having their onset in any month. The same table shows the varying percentages of cases occurring in any month in any year over a period of five years. The figures for any month vary considerably from each other. November is the only month in which the percentage is over the average in every year.

TABLE A.

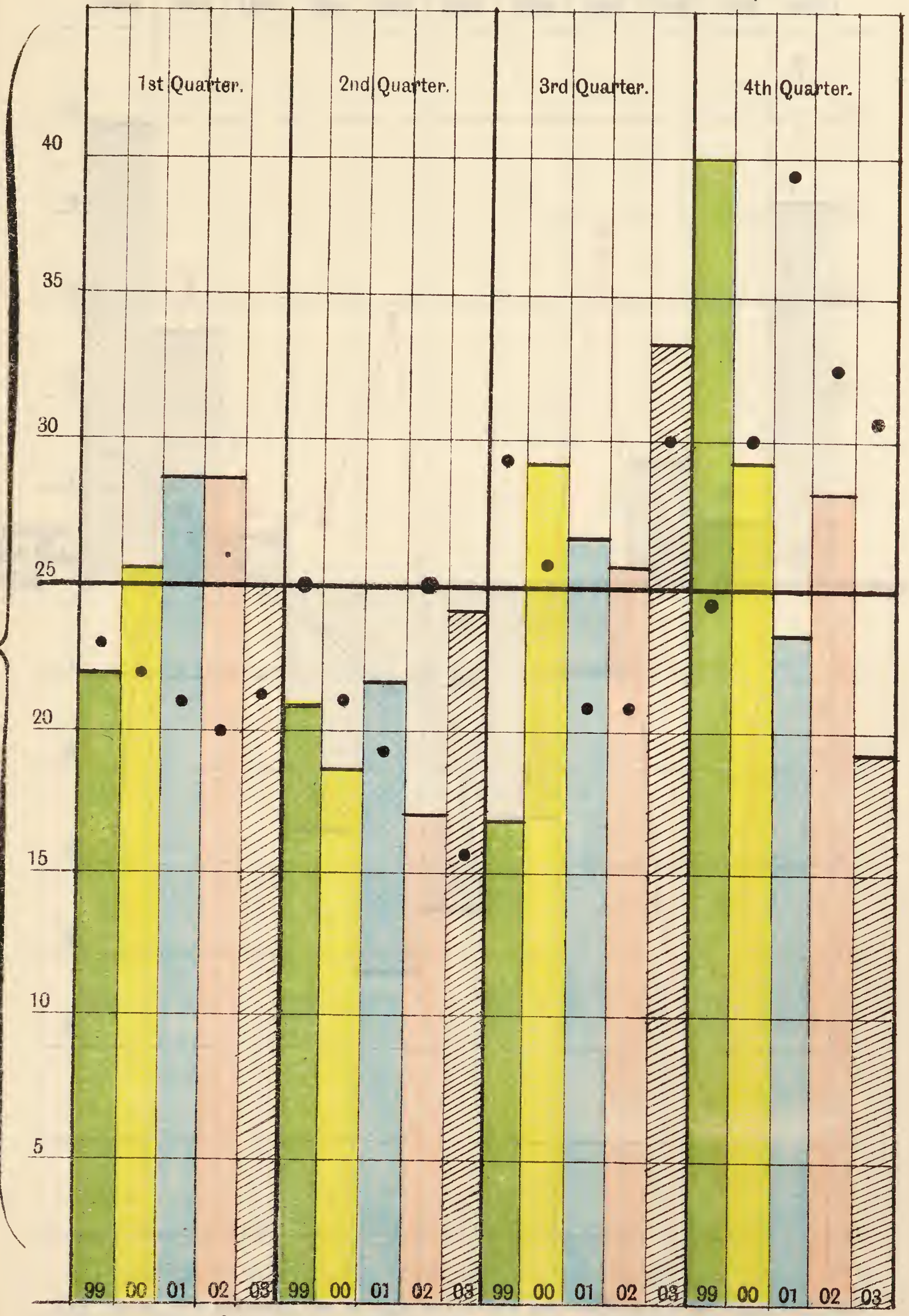
	Average 11 years. 1893–1903.	1898	1899	1900	1901	1902	1903
January.....	8·9	...	10·2	11·6	11·9	8·2	7·0
February	7·9	...	5·5	6·2	10·7	7·3	7·8
March	9·3	...	6·2	7·2	4·9	11·2	8 4
April.....	7 6	...	9·7	3·5	6·5	4·9	6·5
May	6·9	...	6·9	3·3	6·9	6·3	8·8
June	7·8	...	4·3	8·9	7·7	4·6	6·5
July	9·6	8·8	2·4	12·7	10·7	7·9	...
August	7·5	10·5	8·5	5·4	6·6	6·3	...
September ...	8·5	9 0	3·4	5·4	7·7	10·2	...
October	9·0	5·8	5·9	8·3	9·2	6·3	...
November ...	9·8	8·1	13·6	8·1	9·9	9·0	...
December.....	7·3	13·5	14·2	5·9	3·3	6·9	...

The first column of the table gives the percentage number of 4,206 attacks occurring in each month in 11 years (1893-1903) Average percentage $100 \times \frac{1}{12} = 8{\cdot}3$.

The other columns give the percentage of cases occurring in the middle month of each 13 months during 5 years (1898-1903). Average percentage $100 \times \frac{1}{13} = 7{\cdot}7$.

Chart No. 1.

Shewing the relation of rainfall to incidence of Diphtheria in quarters.



The percentages of the annual rainfall in any quarter are represented by black spots. ●

The percentages of the total number of attacks in any year, occurring in any quarter, are represented by coloured columns.

Number of Attacks in each year:—

1899	238	1901	457
1900	337	1902	422

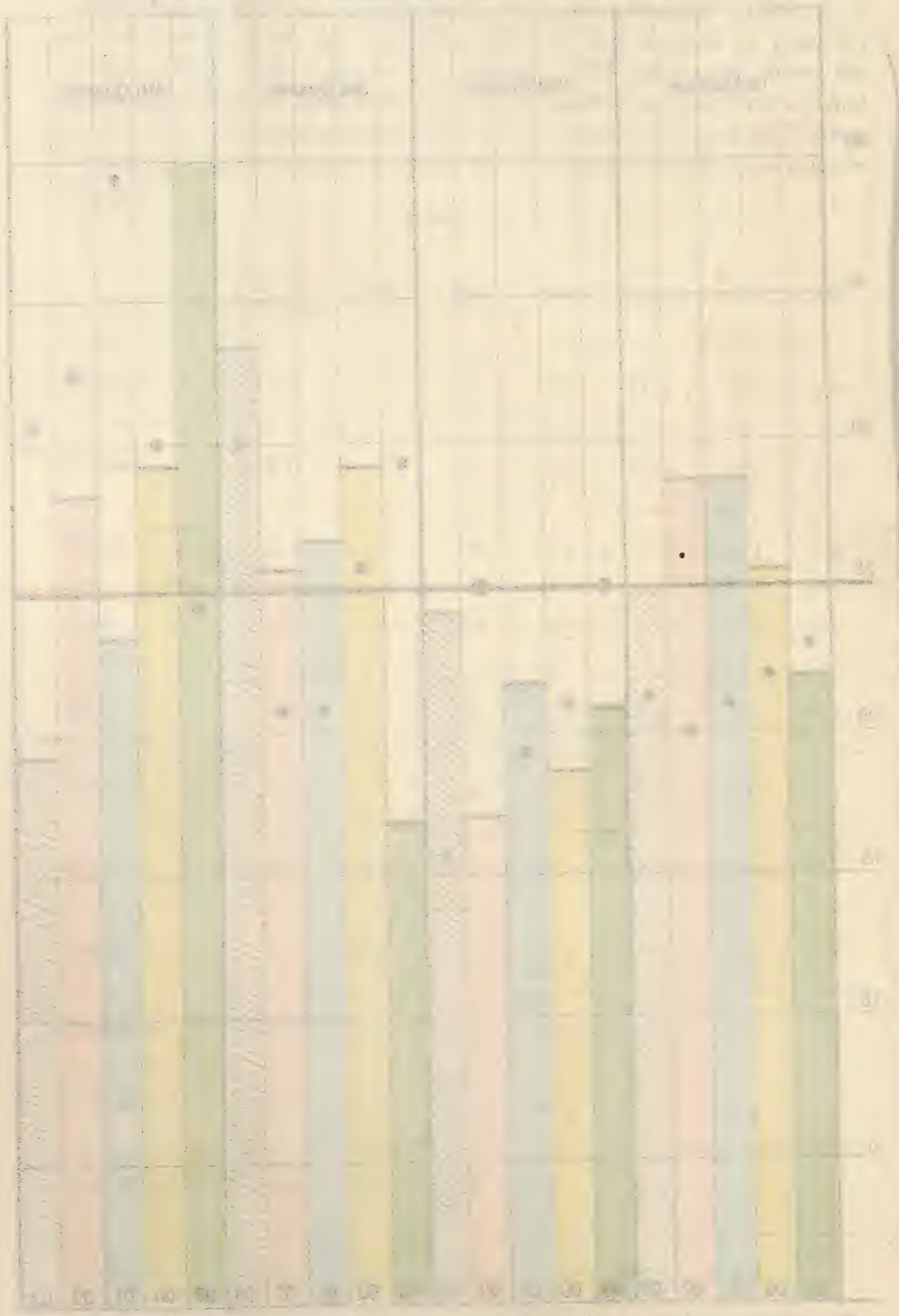
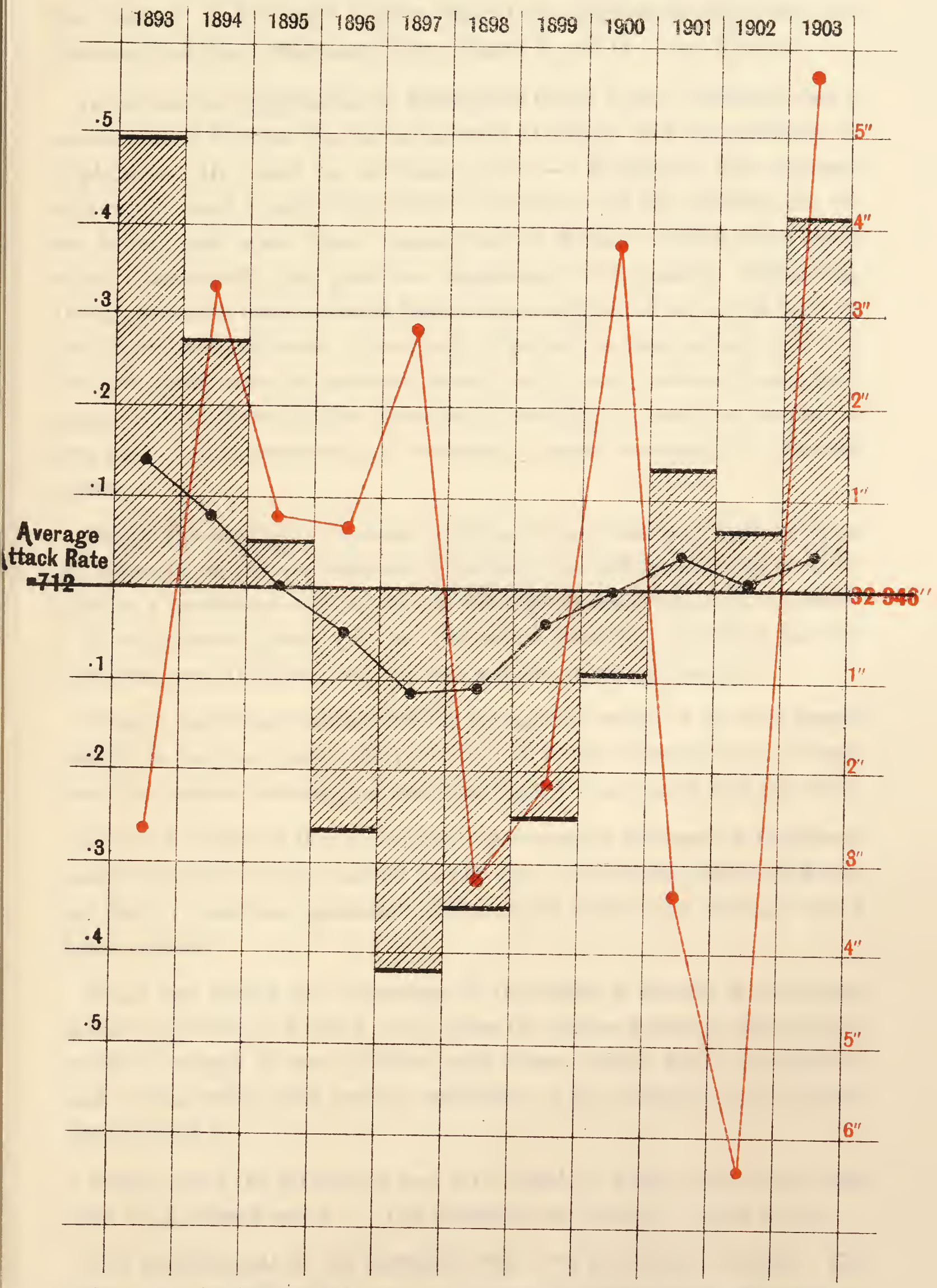


Chart No. 2.



The central line indicates the average attack-rate and death-rate from Diphtheria and Membranous Croup and the average rainfall, over periods of 11 years (1893-1903).

Shaded columns represent in each year how much the attack-rate for that year was above or below the average attack-rate.

The variation from the average (1) of the rainfall is represented in red, (2) of the Diphtheria-Croup death-rate in black (average death-rate ·203).

4,206 cases occurred.



Rainfall is supposed by some writers to have an influence on the spread of the disease. The relation between rainfall and Diphtheria attack-rate and death-rate are shown diagramatically in Charts I. and II. (See Charts.)

In his essay on Diphtheria, Dr. Newsholme comes to the conclusion that a relation exists between the annual amount of rainfall and the incidence of Diphtheria. He states his conclusions thus:—"Diphtheria only becomes epidemic in years in which the rainfall is deficient, and the epidemics are on the largest scale when three or more years of deficient rainfall follow each other. Occasionally dry years are unassociated with epidemic Diphtheria, though usually in these instances there is some evidence of rise in the curve of the Diphtheritic death-rate. Conversely, Diphtheria is nearly always at a very low ebb during years of excessive rainfall, and is only epidemic during such years when the disease in the immediately preceding dry years has obtained a firm hold of the community, and continues to spread presumably by personal infection."

Should this conclusion be correct in the sense that rainfall by itself exercises an influence on the prevalence of Diphtheria, this influence should be traceable in a population such as that of Manchester, exceeding half a million. I have therefore plotted out for a series of years the attack-rate and the death-rate from Diphtheria side by side with the rainfall (Chart II.).

Chart I. shows that increase over the average percentage of the total annual rainfall in any one quarter may or may not be accompanied by an increase over the average percentage of cases occurring in that quarter and vice versa.

Chart II. shows (1) that no apparent relation exists between the Diphtheria attack-rate and the total rainfall for any year; (2) that the death-rate during the last 11 years has diminished with a small rainfall and increased with a heavy rainfall.

When one studies the occurrence of Diphtheria in months in the various districts as shown in Table B, and studies the sudden flares-up (mentioned in previous reports) in some districts while others remain free, one inclines to look to local rather than general conditions as the principal causal factors. (See Table B.)

During 1903 the attack-rate was 1·12, which is higher than in any year since 1893, when it was 1·2. The attack-rate for the last 11 years is ·712.

The mortality-rate is ·25, compared with ·203 for the last 11 years. The death-rate has not increased proportionately with the attack-rate, therefore the case-fatality per cent. is lower than in former years.

Table B.—Diphtheria Attacks Arranged in Months.

Statistical Divisions	January			February			March			April			May			June			July		
	+	−	○	+	−	○	+	−	○	+	−	○	+	−	○	+	−	○	+	−	○
City of Manchester	35	4	10	39	3	5	45	6	7	25	9	8	44	9	7	30	9	5	57	11	8
I.—Manchester Township	1	1	2	6	...	...	4	...	2	3	1	2	6	2	...	4	2	1	5	2	...
II.—North Manchester	9	...	4	21	2	2	25	2	1	12	4	4	22	5	6	16	3	2	13	4	3
III.—South Manchester	25	3	4	12	1	3	16	4	4	10	4	2	16	2	1	10	4	2	39	5	5
I. Ancoats	1	...	2	2	...	...	2	...	...	1	...	1	...	...	...	1	1	...	2	...	...
I. Central	...	...	...	...	...	...	1	...	1	...	...	1	2	...	...	2	...	...	1	1	...
I. St. George's	...	1	...	4	...	...	1	...	1	2	1	...	4	2	...	1	1	1	2	1	...
II. Cheetham	2	...	2	5	1	...	3	1	...	4	2	...	4	...	...	8	2	...	3	1	3
II. Crumpsall	2	...	...	2	...	...	8	...	...	...	...	...	4	...	2	1	...	...	1	...	...
II. Blackley	...	...	1	2	...	...	2	...	...	4	1	3	7	4	2	1	...	1	2	1	...
II. Harpurhey	1	...	...	6	...	...	...	...	...	...	...	...	2	1	1	1	...	...	1	...	...
II. Moston	2	...	1	3	...	...	10	1	1	1	1	...	1	...	...	1	...	...	1	...	...
II. Newton	...	...	...	...	...	1	1	...	...	2	...	1	3	...	...	2	...	...	3	1	...
II. Bradford	2	...	...	1	...	1	...	...	...	...	...	...	1	...	...	1	...	1	1	1	...
II. Beswick	...	...	...	1	1	...	1	...	...	1	...	...	...	...	...	...	...	...	1	...	...
II. Clayton	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...
III. Ardwick	6	...	...	...	...	...	1	...	...	3	3	...	1	...	...	2	1	...	3	...	...
III. Openshaw	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
III. West Gorton	2	...	...	1	...	1	1	...	...	1	...	...	2	...	...	2	1	...	...	1	...
III. Rusholme and Kirk.	10	...	3	5	...	...	5	1	1	...	...	...	3	...	...	2	...	...	5	...	...
III. Chorlton-on-Medlock	3	2	...	4	1	2	8	3	1	3	...	1	1	...	...	...	1	...	1	1	1
III. Hulme	4	...	1	2	...	...	1	...	2	3	1	1	9	2	1	4	1	2	30	3	4

+ Indicates that the swabs revealed diphtheria bacilli. − That they did not do so. ○ That no examination was made.

TABLE B.—DIPHTHERIA ATTACKS ARRANGED IN MONTHS—*continued.*

STATISTICAL DIVISIONS		August			September			October			November			December			Totals		
		+	–	○	+	–	○	+	–	○	+	–	○	+	–	○	+	–	○
City of Manchester		38	6	9	62	9	6	29	13	9	37	4	8	9	10	1	450	93	83
I.—Manchester Township		2	...	1	7	2	2	3	4	2	4	...	3	1	1	...	46	15	15
II.—North Manchester		11	4	3	14	...	1	7	3	4	8	1	2	4	5	1	162	33	33
III.—South Manchester		25	2	5	41	7	3	19	6	3	25	3	3	4	4	...	242	45	35
I.	Ancoats	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	9	1	4
	Central	2	...	1	1	1	...	...	3	1	1	...	2	1	1	...	11	6	6
	St. George's	...	...	...	6	1	2	3	1	...	3	...	1	...	...	...	26	8	5
II.	Cheetham	6	2	1	8	...	...	4	2	2	5	1	...	2	3	...	54	15	8
	Crumpsall	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	20	1	2
	Blackley	...	...	...	...	...	1	1	...	...	1	...	...	1	1	...	21	7	8
	Harpurhey	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	13	1	1
	Moston	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	20	2	3
	Newton	...	...	2	1	...	...	...	...	1	...	...	...	...	...	...	12	1	5
	Bradford	5	1	...	1	...	...	2	...	...	...	...	1	...	1	...	14	3	3
	Beswick	...	...	...	2	...	...	...	...	...	...	...	1	...	...	1	6	1	2
	Clayton	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	2	1
III.	Ardwick	4	...	...	8	...	1	5	...	2	2	1	...	...	1	...	35	6	3
	Openshaw	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	1	...
	West Gorton	1	...	...	...	...	...	1	...	...	5	1	2	2	1	...	18	4	3
	Rusholme and Kirkmanshulme	2	...	...	5	...	...	1	...	...	5	...	...	2	...	...	45	1	4
	Chorlton-on-Medlock	...	...	...	9	2	1	3	1	...	6	...	...	...	1	...	38	12	6
	Hulme	18	2	5	19	5	1	9	5	1	5	1	1	...	1	...	104	21	19

+ Indicates that the swabs revealed diphtheria bacilli. – That they did not do so. ○ That no examination was made.

The following are the tables relating to Diphtheria and Membranous Croup during the year 1903 :—

DIPHTHERIA, MEMB. CROUP, 1903.—ATTACKS IN WEEKS, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 10	13	April 11	7	July 11	14	Oct. 10	14
,, 17	15	,, 18	9	,, 18	27	,, 17	12
,, 24	5	,, 25	13	,, 25	16	,, 24	9
,, 31	9	May 2	14	Aug. 1	11	,, 31	8
Feb. 7	8	,, 9	19	,, 8	12	Nov. 7	6
,, 14	12	,, 16	17	,, 15	12	,, 14	13
,, 21	16	,, 23	7	,, 22	11	,, 21	13
,, 28	12	,, 30	9	,, 29	13	,, 28	16
Mch. 7	17	June 6	8	Sept. 5	19	Dec. 5	3
,, 14	13	,, 13	14	,, 12	16	,, 12	9
,, 21	16	,, 20	9	,, 19	22	,, 19	5
,, 28	6	,, 27	10	,, 26	18	,, 26	4
April 4	9	July 4	15	Oct. 3	11	Jan. 2	4
Total...	151	Total...	151	Total...	202	Total..	116

City total, 620.

DIPHTHERIA AND MEMB. CROUP ATTACKS, 1903.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1898	1899	1900	1901	1902	Mean	1893
Twelve Notification Towns ...	0·85	2·06	1·89	1·67	1·51	**1·60**	1·20
City of Manchester	0·36	0·45	0·62	0·84	0·77	**0·61**	1·12
Manchester Township.....	0·20	0·31	0·34	0·58	0·61	**0·41**	0·54
North Manchester	0·70	0·81	1·14	1·10	0·78	**0·91**	1·32
South Manchester	0·26	0·33	0·44	0·79	0·84	**0·53**	1·28

DIPHTHERIA, MEMB. CROUP, 1903.—NUMBER OF ATTACKS, OF DEATHS, AND CASE FATALITY AT DIFFERENT AGES, FOR THE TEN YEARS 1893-1902, AND FOR 1903.

	1893-1902			1903		
AGES	ATTACKS	DEATHS	CASE FATALITY*	ATTACKS	DEATHS	CASE FATALITY*
Under one year ...	114	81	71·1	10	7	70·0
1 to 2 years ...	295	177	60·0	50	29	58·0
2 to 3 „ ...	317	170	53·6	50	18	36·0
3 to 4 „ ...	409	179	43·7	74	19	25·6
4 to 5 „ ...	381	145	38·0	62	15	24·2
5 to 6 „ ...	293	106	36·2	75	16	21·3
6 to 7 „ ...	198	58	29·3	38	8	21·1
7 to 8 „ ...	179	43	24·0	38	8	21·1
8 to 9 „ ...	135	30	22·2	38	5	13·2
9 to 10 „ ...	115	13	11·3	23	2	8·7
10 to 15 „ ...	324	24	7·4	81	5	6·2
15 to 20 „ ...	233	9	3·9	19	2	10·5
20 to 25 „ ...	196	6	3·1	19	...	...
25 to 35 „ ...	242	11	4·5	30	1	3·3
35 to 45 „ ...	103	4	3·9	7	...	...
45 to 55 „ ...	37	1	2·7	5	1	20·0
55 to 65 „ ...	8	...	...	1	...	...
Over 65 „ ...	6	...	...	...	...	...
All ages	3585	1057	29·4	620	136	21·9

* The percentages in this column are the actual proportions of fatal cases to the attacks at those ages.

DIPHTHERIA AND MEMBRANOUS CROUP, 1903.—ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	13	0·29	30·8	61·6
Central	20	0·70	25·0	70·0
St. George's	39	0·66	23·1	53·8
Cheetham	78	2·01	19·2	66·7
Crumpsall	24	2·65	8·3	37·5
Blackley	36	3·92	27·8	19·4
Harpurhey	15	0·84	6·7	40·0
Moston	25	1·76	40·0	84·0
Newton Heath	17	0·46	23·5	52·9
Bradford	19	0·78	31·6	68·4
Beswick	9	0·75	...	44·4
Clayton	5	0·51	...	60·0
Ardwick	45	1·06	24·4	66·7
Openshaw	3	0·11	33·3	...
Gorton (West)	24	0·79	12·5	58·3
Rusholme and Kirk.	49	1·92	10·2	40·8
Chorlton-on-Medlock	55	0·96	25·4	58·2
Hulme	144	2·18	25·0	65·3
City of Manchester	**620**	**1·12**	**21·9**	**57·6**

† Corrected : the fatal cases are those actually occurring amongst the cases notified.

DIPHTHERIA, MEMB. CROUP MORTALITY, 1903.—RATE PER 1000 LIVING COMPARED WITH MEAN OF FIVE YEARS.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales	0·24	0·29	0·27	0·27	0·23	**0·26**	0·18
*76 Great Towns	0·31	0·40	0·35	0·30	0·26	**0·32**	0·20
London	0·40	0·43	0·34	0·30	0·25	**0·34**	0·16
Manchester City	0·09	0·16	0·19	0·24	0·22	**0·18**	0·25
Manchester Township	0·06	0·12	0·18	0·16	0·19	**0·14**	0·16
North Manchester	0·15	0·26	0·23	0·30	0·21	**0·23**	0·26
South Manchester	0·08	0·11	0·16	0·25	0·25	**0·17**	0·28
*103 Smaller Towns	0·28	0·28	0·29	0·28	0·24	**0·27**	0·16
Rural Districts	0·18	0·21	0·23	0·24	0·20	**0·21**	0·17

* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns.

The cause of the diminution of the case fatality to 21·9 per cent., compared with 28·4 per cent. for the last eleven years, may be due in part to the following :—

(1) A milder type of the disease.

(2) The notification of mild cases which in former years would have been considered non-diphtheritic.

(3) The earlier treatment of cases with antitoxin.

The districts showing attack-rates of over 2 per 1000 living are Blackley Crumpsall, Hulme, and Cheetham, with rates of 3·92, 2·65, 2·18, and 2·01. If the numbers of cases connected with school epidemics in Hulme and Cheetham be deducted, their attack-rates are reduced to 1·71 and 1·75.

During the last three years Cheetham has had a comparatively high attack-rate. This district contains the Jewish quarters. The high attack-rate may be due to a racial liability, or to the crowded and dirty houses in which many of these people live.

School Epidemics.—Considerable outbreaks occurred in Lloyd Street School, Hulme; St. John's School, Cheetham; and Moston Lane Board School, Blackley. The dates of the onsets of the cases are given below :—

Dates of Onset—Lloyd Street Board School.

May 7, *10, 13, 17, 22, 31 } May 30th to June 6th, holidays.
June 26, *30 }

July 1, †9, *14, 26 } July 18th to August 15th,
Aug. 9, 17, 18, †20, 23, 28, 29 } hoildays.

September †2, *5, *11, 11, 11, †13, 14, 17, 18, †24.

October †7, 16, 19.

November *18.

All cases of sore throat were reported after the 14th September.

Dates of Onset—St. John's Church of England School, Cheetham.

September †15, †17, 17.

October †*9, †*11, 23, *30.

November 3, *13, †30.

All cases of sore throat were reported after the 30th November.

Dates of Onset—Moston Lane Board School.

February *16, 18, *21, *25.

March †2, *3.

June †7, 9.

July †13.

† Males. * Were not in Infant Department.

As one expects, the greater number of cases occur in the Infant Department. It is noteworthy that so large a number of girls were attacked in the Infant Department of Lloyd Street School, compared with the number of boys. In the year ending 30th April, 1904, an average of 224 boys and 212 girls attended daily.

Steps taken to deal with the school outbreaks.—Dr. Ritchie, the Medical Officer for Schools, was asked by the Medical Officer of Health to report all cases of sore throat occurring at the schools in question. When reported, these were at once visited at their homes. If a doctor were in attendance, he was asked to take a swab from the throat for examination ; if not, and if the parents expressed no desire to go to their own medical attendant, a swab for bacteriological examination was taken by the Assistant to the Medical Officer of Health. The children were not allowed to return to school until a negative result had been obtained. Precautions such as are taken in true cases of Diphtheria were adopted if the swab were returned positive.

Whether as a result of these measures or not, the Lloyd Street School epidemic gradually ceased and that of St. John's School immediately stopped.

Careful notes were taken of the conditions of the nose, teeth, throat, and submaxillary glands in 51 cases. In most of these no certain conclusion as to the likely result of the swab could be arrived at from the local conditions.

	Source of Swab	+	—	?
Swabs taken by the Assistant to the Medical Officer of Health from children sent from school because of sore throat.	Faucial	12	27	4
	Nasal.....	2	2	...
	Faucial and Nasal	2	1	1

A few remarks on the guiding points in the diagnosis of some of these mild cases are given below.

Nasal discharge.—Three cases of slight nasal discharge with unilateral sores occurred. In each of these cases a positive result was returned. From previous experience this is regarded as a most important sign. Slightly blood-stained nasal discharges also frequently contain Diphtheria bacilli.

Fauces.—Exudate low down on the posterior aspect of the tonsil was observed in one positive case. Exudate in this position, on the posterior pillars of the fauces or on the adjacent wall of the pharynx, if confined to these positions, nearly always indicates Diphtheria.

Throats which bled readily on a gentle application of the swab usually gave positive results.

Submaxillary glands.—The condition of these is greatly dependent on the condition of the teeth. If the teeth are good, then unilateral or unequal enlargement of the glands in the submaxillary region should be regarded with suspicion. Tenderness, or slight œdema, of the tissues in this region, if unilateral, are useful indications in those mild cases.

Diphtheria bacilli carried by contacts.—It is now generally accepted that persons who have been in contact with cases of Diphtheria frequently carry Diphtheria bacilli in their nose or throat, although remaining apparently healthy.

Ninety-five contacts were examined. In swabs from 43 of these, Diphtheria bacilli were found. The virulence of these bacilli was not tested.

The results of the swabs are tabulated below. The table shows in weeks the time elapsing between the onset in the infecting case and the taking of the swab. The source of the swab is given. Swabs in which the source is doubtful, or swabs taken from ear discharges, are not noted.

Swabs taken in the	Throat		Nose	
	+	−	+	−
1st week	1	15	21	16
2nd ,, ...	5	7	10	4
3rd ,, ...	...	...	2	1
4th ,, ...	...	1	...	...
5th ,, ...	1	...	2	...
6th ,, ...	1	...	...	...
Later	...	1	1	...
Totals	8	24	36	21

As far as one can judge from the figures above a large number of contacts with Diphtheria cases are carriers of Diphtheria bacilli. These bacilli at times

persist for considerable periods. From work done in America† there is no doubt that some of these contacts carry virulent Diphtheria bacilli. It is very difficult to persuade laymen, and at times even medical men, that apparently healthy individuals are infectious. The isolation and treatment of such cases are thus rendered very difficult. Moreover, the law does not give the local authority any power to deal with healthy but probably infectious contacts. One can insist on isolation only if the person be suffering from a dangerous infectious disease. It appears that the first necessity is to obtain legal power to proceed.

In Manchester, of 61 cases not suffering from Diphtheria, but who were bearers of Diptheria bacilli, 29 were removed to hospital, a protective dose of antitoxin was given, and they were discharged free from infection. In some of the remainder, neither treatment nor proper isolation were carried out.

Methods for dealing with infectious contacts who are not willing to go to hospital :—

(1) An out-patient department in connection with Fever Hospitals has been suggested. The infected contacts could have a nose and throat douche daily. In Manchester this would necessitate such individuals exposing themselves, not only in public places in the open air but in public conveyances, whilst they are in an infectious condition.

2. The treatment would probably be best carried out by tactful Fever-trained Nurses, who would visit the contacts at their homes, and carry out the required douching under the direction of the attendant Physician or the Medical Officer of Health.

The prevention of the spread of the disease by the injection of antitoxin was considered, but time was not found to carry it out.

A table has been prepared, showing the times elapsing between primary and subsequent attacks where more than one case occurred in one house.

INTERVALS BETWEEN ONSETS OF PRIMARY AND SUBSEQUENT CASES.

In Days														In Weeks						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	3	4	5	6	7	8	9
4	** 9	6	** 12	6	* 7	* 8	5	* 4	2	3	2	2	1	8	2	...	2	...	2	* 2

* = One Death.

If it had been possible to inject (1) all contacts at home, (2) contacts at home under 10 years, with 500 units antitoxin on the third day of disease in the primary case, then in the first case 2,552 contacts would have been

† Hermann Biggs, Scientific Bulletin (No. 1), Health Department, City of New York.

injected, and 74 attacks (taking for granted the potency of antitoxin for this purpose) would have been avoided or modified at a cost of 17s. 3d. each in antitoxin; in the second case, the figures are 786 contacts injected, 49 attacks modified or avoided, at a cost of 8s. each.

In order to find out how our energy may be most usefully directed, an analysis of the cases in 1903 has been made in order to find out :—

(*1*) *The age and sex of the persons most likely to spread infection.*

The table shows the proportions of primary cases which presumably infected cases in the same house :—

Ages						Totals	
	0–4	5–9	10–14	15–24	25 and over	As fractions	Actual figures
Males and Females.	$\frac{1}{9}$	$\frac{1}{8}$	$\frac{1}{21}$	$\frac{1}{8}$	$\frac{1}{21}$	$\frac{2}{19}$	$\frac{66}{628}$
Males	$\frac{1}{12}$	$\frac{1}{11}$	$\frac{0}{40}$	$\frac{1}{10}$	$\frac{1}{13}$	$\frac{1}{13}$	$\frac{21}{280}$
Females	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{2}{11}$	$\frac{2}{15}$	$\frac{1}{30}$	$\frac{1}{8}$	$\frac{45}{348}$

From these figures it appears that females gave rise to infection more frequently than males. Females from 10 to 14 gave rise to infection more frequently than at any other age.

(*2*) *The age and sex of the persons most likely to be infected.*

The table shows the proportion of contacts at home who contracted the disease :—

Ages								Totals	
	Under 1	1–3	4–6	7–9	10–14	15–24	25 and over	As fractions	Actual figures
Males and Females.	$\frac{1}{101}$	$\frac{2}{21}$	$\frac{2}{23}$	$\frac{2}{45}$	$\frac{2}{41}$	$\frac{1}{57}$	$\frac{1}{87}$	$\frac{2}{59}$	$\frac{86}{2552}$
Males	$\frac{1}{66}$	$\frac{1}{10}$	$\frac{2}{31}$	$\frac{2}{45}$	$\frac{2}{43}$	$\frac{1}{77}$	$\frac{1}{533}$	$\frac{1}{36}$	$\frac{35}{1255}$
Females	0	$\frac{2}{21}$	$\frac{1}{9}$	$\frac{2}{45}$	$\frac{1}{20}$	$\frac{1}{42}$	$\frac{1}{50}$	$\frac{2}{51}$	$\frac{51}{1297}$

Judging from this table, the contacts most requiring attention are contacts from 1 to 6 inclusive.

Taking the ages in years, one finds that from female contacts aged from 1 to 7, and from male contacts aged from 1 to 5, one out of every 7 to 11 is attacked.

The case fatality at ages under 7 is in round figures 45 per cent, compared with 9 per cent. for all other ages (see case fatality table for the 10 years 1893-1902).

From a consideration of these facts alone, the conclusion is that all contacts under the age of 7 should be injected with antitoxin.

(3) *The effect of good isolation.*

In no house in which the isolation was considered "good," have other cases occurred subsequent to the date of notification, except from amongst those nursing the patient.

(4) *The effect of removal to hospital.*

The table shows the number of cases which occurred after removal of the primary case to hospital. It also shows the interval between the removal of the primary and the onset in the secondary case :—

	Days						Weeks	
Interval	1	2	3	5	6	11	3rd	4th
	3	5	1	3	3	3	2	1

Taking an active incubation period of 4 days, then 9 of those cases were probably infected by the primary case directly.

The remaining 12 cases must either have had the bacilli lying inactive for a time, until from some cause there was a depression of the vitality of the adjacent tissues, when an active incubation period commenced (Newsholme), or they have been infected by some healthy bacillus-bearing contact. Cases 291 and 292 were removed to hospital on 2nd July; the onset of the next case was on 18th July. A swab from the mother's throat, on August 24th, gave short Diphtheria bacilli.

Therefore, freedom from the risk of infection may not be attained by the removal of the patient and complete house disinfection.

Cases in which there appeared possibility of infection having been conveyed from Monsall Hospital. If not stated otherwise the subsequent cases occurred in the same house as the primary case :—

A.—Case 61, F, 10, and Case 62, M. 4. Took ill on the 9th and 13th February and died on the 22nd February and 2nd March. Their sister was a Monsall ward maid, who visited home while suffering from an attack of Diphtheria (onset 7th February). The ward maid failed to report herself sick until after her "day off."

B.—Case 63, F. 18. Onset February 13th. Brother, M. 5, a case of Scarlet Fever was discharged from Monsall on 23rd January. This boy had nasal discharge on Inspector's visit.

C.—Five members of one family were discharged from hospital after Scarlet Fever during the fortnight preceding February 4th. The last to be discharged (3rd February) was a male, aged 7, who was suffering from nasal discharge on the Inspector's visit. Case 66.—A playmate took Diphtheria on the 12th February. Cases 80 and 81.—Members of the same family failed on the 26th and 27th February.

D.—Case 121, F. 18, and Case 134, F. 8.—Onsets 15th March. Had a sister discharged from hospital on 6th March after Scarlet Fever.

E.—Case 271, M. $\frac{14}{12}$. Onset 19th June. Brother discharged from hospital 9th June, after Scarlet Fever, with ear discharge. Ear discharge had stopped before ear swab was obtained.

F.—Case 312, F. 10. Onset 11th July. (Dr. Gordon's diagnosis—Follicular tonsillitis, exudate easily removed, did not re-form, not so white as that of Lacunar Diphtheria, Monsall swabs negative. College reports 1st specimen a few Diphtheria bacilli, 2nd specimen negative). Brother, Case 224, discharged from hospital on 23rd June after Diphtheria.

G.—Case 320, F. 6. Discharged after Diphtheria on 18th August. Two swabs from a nasal discharge taken on the 10th and on the 13th September; the result of the first was negative, the second positive. Case 436, F. 3, Case 457, F. 33, and Case 454, F. $\frac{18}{12}$, failed on the 4th, 7th, and 10th September.

H.—Case 341. Was discharged on the 25th August, nasal swab on 14th September was negative. Case 446, F. 5, had onset on 4th September.

I.—Case 471, M. 7. Discharged on 23rd October. Tonsils enlarged. Two swabs from nose and throat taken on 4th November were negative. Case 579, F. 9. Had onset on the 30th October.

J.—Case 315, M. $\frac{15}{12}$. Discharged on 6th November (onset on 14th July), had Diphtheria bacilli in the nasal discharge on the 16th November. This child was frequently left at the house of Case 591, F. 2 (onset 11th November).

K.—Case 323, M. 3. Discharged on the 11th August. Swab from nasal discharge gave a positive result on the 12th September. Case 464, F. 5. Failed on the 10th September, and died on the 21st September.

L.—Cases 480 and 486, F. 9 and F. 7. Discharged on 9th and 13th October. These two girls were frequently in the house of Case 558. Onset 16th October. The houses had a common yard.

There is no proof that any of the above cases were infected from hospital.

It has been pointed out that a large number of healthy Diphtheria contacts are carriers of Diphtheria bacilli. Swabs were in certain cases taken from the suspected discharged case, but these were only obtained after contact with the cases they were supposed to have infected. The fact that negative cultures are obtained from all cases of Diphtheria, and from cases of Scarlet Fever with nasal discharge, before they are sent out from Monsall Hospital, gives good reason for believing that the majority of the cases noted above were not return cases. On the other hand, a negative swab, obtained from a discharged case some days after the onset of the supposed secondary case, gives no strong evidence that the discharged case was not the source of infection. The number of cases from houses to which discharged cases have been sent favours the view that some of the above were return cases.

In a preliminary paper in the "Journal of Pathology and Bacteriology," May, 1903, the frequency of the presence of Diphtheria bacilli in post scarlatinal ear discharges was noted.

The bacilli found were morphologically indistinguishable from true Diphtheria bacilli.

A research was carried out under the direction of Professor Delépine. Its object was to ascertain from the cultural characteristics and the virulence of these Diphtheroid bacilli whether or not they could be classed as true Diphtheria bacilli.

Dr. A. K. Gordon, Superintendent of the Fever Hospital, kindly allowed me to take all the necessary clinical material from cases under his care. In this report it is sufficient to summarise the results of the research.

The Diphtheroid bacilli differed from each other in many ways, and evidently belonged to several groups.

The majority, however, had the following characters. They were beaded bacilli, taking Gram's and Neisser's stain, giving an acid reaction in ordinary peptone broth and in glucose broth within 48 hours; they grew rapidly on serum, and presented greyish yellow colonies.

They differed from true Diphtheria bacilli in giving a slight visible growth on neutral potato. They were not lethal to guinea pigs within 48 hours after inoculation. In the cases in which the guinea pig died, the characteristic lesions produced by true Diphtheria bacilli were not found.

These bacilli at present cannot be classified as true Diphtheria bacilli, neither do they belong to the commonly recognised varieties of pseudo Diphtheria bacilli.

To determine their pathological importance a further research is indicated.

The particulars of the bacteriological examinations made at the College are given below, along with the bacteriological results in cases of infection from a primary case at home :—

	+ Infected from	— Infected from	O Infected from	? Infected from
+	59	5	7	1
?	3	...	...	...
—	2	1	2	1
O	3	...	2	...

STATEMENT OF BACTERIOLOGICAL EXAMINATIONS

	Specimens collected by Medical Practitioners					Specimens		
				Duplicate and control specimens				
Total number of examinations made	Positive	Negative—Medical Attendant adhered to his diagnosis	Negative—Medical Attendant accepted the diagnosis	Positive	Negative	Positive	Negative—Diagnosed Diphtheria	Negative—Diagnosed as other diseases
1326	354	48	416	19	44	116	19	35

Collected at Monsall Hospital and a few at Clayton Hospital.

Duplicate and control specimens		Post scarlatinal		Cases from outside districts		Monsall Staff		Specimens from diphtheritic throats considered not diphtheria	
Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
20	31	2	6	5	0	9	12	81	109

DUNCAN FORBES, M.D.

ENTERIC FEVER.

In 1903 there were 387 cases of Enteric Fever reported.

Table 3.—The attack rate is 0·70 compared with a mean attack rate of 0·79 for the previous five years. This rate compares favourably with that of the 12 notification towns, which is 0·81.

Table 6.—The death-rate is 0·17, which is the same as that for England and Wales for the previous five years, but is greater than the average for the same years in Manchester, which is 0·15.

Table 5.—The case fatality is 23·8 per cent. The table of case fatality for the ten years 1893-1902 deals with 4,725 cases. From a table treating of such a large number of cases an approximate idea should be gained, not only of liability to death on attack at a given age, but also of the liability to attack at different ages. During the first five years of life the case mortality is 14·7. Thereafter it is most convenient to collect the remaining age groups into four divisions, in which the various group case fatality percentages approximate to each other.

5—15.....	Case Fatality—	10·5
15—35.....	Do.	—20·8
35—55.....	Do.	—30·3
Over 55.....	Do.	—46·8

The greatest liability to attack is at the age period of 15-20. The liability decreases rapidly as one passes to younger, but more slowly towards older ages.

The following are the tables referring to this disease :—

I.—Enteric Fever Attacks Reported in Quarters.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1891.....	173	119	180	289
1892.....	164	106	156	184
1893.....	108	80	220	210
1894.....	118	75	135	132
1895...	110	90	100	193
1896.....	118	130	108	157
1897.....	97	57	137	212
1898.....	143	79	134	286
1899.....	101	66	104	110
1900.....	85	78	103	112
1901.....	43	43	149	124
1902.....	63	82	111	122
1903.....	90	82	87	128

2.—ENTERIC FEVER ATTACKS IN WEEKS REPORTED IN 1903, ACCORDING TO DATE OF ONSET.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Jan. 10	8	Apl. 11	10	July 11	5	Oct. 10	12
,, 17	3	,, 18	4	,, 18	6	,, 17	13
,, 24	4	,, 25	4	,, 25	6	,, 24	9
,, 31	5	May 2	3	Aug. 1	6	,, 31	5
Feb. 7	8	,, 9	1	,, 8	6	Nov. 7	16
,, 14	4	,, 16	6	,, 15	6	,, 14	15
,, 21	11	,, 23	7	,, 22	6	,, 21	9
,, 28	7	,, 30	14	,, 29	6	,, 28	8
Mch. 7	5	June 6	7	Sept. 5	5	Dec. 5	9
,, 14	6	,, 13	3	,, 12	4	,, 12	11
,, 21	9	,, 20	12	,, 19	6	,, 19	9
,, 28	6	,, 27	5	,, 26	11	,, 26	7
April 4	14	July 4	6	Oct. 3	14	Jan. 2	5
Total...	90	Total...	82	Total...	87	Total...	128

City Total 387

3.—ENTERIC FEVER ATTACKS, 1903.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1898	1899	1900	1901	1902	Mean	1903
Twelve Notification Towns...	1·53	1·60	1·12	1·26	1·01	**1·30**	0·81
City of Manchester.....	1·19	0·70	0·70	0·66	0·69	**0·79**	0·70
Manchester Township.....	1·29	0·77	0·65	0·65	0·80	**0·83**	0·77
North Manchester	1·42	0·73	0·80	0·77	0·85	**0·91**	0·59
South Manchester	0·99	0·64	0·65	0·58	0·52	**0·68**	0·73

4.—Enteric Fever, 1903.—Number of Attacks in Districts, with Attack Rate, Case Fatality per cent., and Removals to Hospital per cent.

Districts	Attacks	Attack Rate per 1,000 living	† Case Fatality per cent.	Removals to Hospital per cent.
Ancoats	32	0·72	31·2	71·8
Central	20	0·70	30·0	80·0
St. George's	50	0·84	16·0	92·0
Cheetham	19	0·49	21·1	68·4
Crumpsall	4	0·44	50·0	75·0
Blackley	3	0·33	66·7	66·7
Harpurhey	4	0·22	25·0	75·0
Moston	5	0·35	...	80·0
Newton Heath	30	0·81	16·7	90·0
Bradford	22	0·90	36·4	68·2
Beswick	11	0·92	18·2	63·6
Clayton	4	0·41	...	50·0
Ardwick	44	1·03	25·0	77·3
Openshaw	20	0·72	30·0	80·0
Gorton (West)	38	1·25	13·2	78·9
Rusholme and Kirk...	16	0·63	6·3	56·2
Chorlton-on-Medlock..	20	0·35	45·0	50·0
Hulme	45	0·68	26·7	75·6
City of Manchester.	**387**	**0·70**	**23·8**	**76·0**

† Corrected; the fatal cases are those actually occurring amongst the cases notified.

5.—Enteric Fever.—Number of Attacks, of Deaths, and Case Fatality per cent. at Different Ages, for the Ten Years 1893–1902, and for 1903.

Ages	1893-1902			1903		
	Attacks	Deaths	Case Fatality per cent.	Attacks	Deaths	Case Fatality per cent.
Under one year ...	5	2	40·0	...	...	...
1 to 2 years ...	22	7	31·8	2	...	...
2 to 3 „ ...	41	3	7·3	8	1	12·5
3 to 4 „ ...	78	11	14·1	6	1	16·7
4 to 5 „ ...	99	13	13·1	5	...	...
5 to 6 „ ...	120	14	11·7	8	1	12·5
6 to 7 „ ...	110	13	11·8	10	1	10·0
7 to 8 „ ...	117	11	9·4	7	2	28·6
8 to 9 „ ...	130	10	7·7	8	1	12·5
9 to 10 „ ...	116	10	8·6	7	...	...
10 to 15 „ ...	683	76	11·1	47	8	17·0
15 to 20 „ ...	817	151	18·4	38	8	21·1
20 to 25 „ ...	771	159	20·6	63	18	28·6
25 to 35 „ ...	917	211	23·0	109	28	25·7
35 to 45 „ ...	432	129	29·8	39	10	25·6
45 to 55 „ ...	188	59	31·3	23	10	43·5
55 to 65 „ ...	64	30	46·9	6	2	33·3
Over 65 „ ...	15	7	46·7	1	1	100·0
All ages	4725	916	19·4	387	92	23·8

6.—Enteric Fever Mortality, 1903. Rate per 1000 living, Compared with Mean of Five Years.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales	0·18	0·20	0·16	0·16	0·13	**0·17**	0·10
London.....	0·14	0·18	0·17	0·12	0·13	**0·15**	0·09
Dublin	0·49	0·55	0·38	0·32	0·33	**0·41**	0·24
City of Manchester	0·22	0·13	0·14	0·14	0·12	**0·15**	0·17
Manchester Township	0·25	0·15	0·14	0·16	0·12	**0·16**	0·16
North Manchester	0·24	0·11	0·14	0·13	0·11	**0·15**	0·15
South Manchester	0·19	0·14	0·14	0·13	0·12	**0·14**	0·18

A record of the number of flies caught daily in eight fly traps (five of which were in the wards at Monsall, and three in the wards at Clayton) was kept by several nurses at these hospitals. To these we are indebted for very careful observations.

During the week ending 11th July to the week ending 19th September eight traps were used. From that date up to the 28th November the records of two only have been noted.

A table has been prepared showing together in weeks the numbers of (1) onsets of Enteric attacks, (2) deaths from Diarrhœa, (3) flies caught :—

Weeks ending.....	July 11th.	July 18th.	July 25th.	Aug. 1st.	Aug. 8th	Aug. 15th.	Aug. 22nd.	Aug. 29th.	Sep. 5th.	Sep. 12th.	Sep. 19th.
Enteric Attacks ...	5	6	6	6	6	6	6	6	5	4	6
Diarrhœa Deaths...	6	13	14	14	24	29	39	42	31	21	24
Hundreds of Flies caught in eight traps	7	9	8	12	12	17	19	over 19	16	11	10

Weeks ending.....	Sep. 26th.	Oct. 3rd.	Oct. 10th.	Oct. 17th.	Oct. 24th.	Oct. 31st.	Nov. 7th.	Nov. 14th.	Nov. 21st.	Nov. 28th.	
Enteric Attacks ...	11	14	12	13	9	5	16	15	9	8	.....
Diarrhœa Deaths...	20	26	20	23	11	7	9	6	6	2	.....
Flies caught in two traps.....	43	38	35	47	33	9	11	3	3	3	.....

Although admitting that in warm countries, under such conditions as prevailed in the South African War, Typhoid bacilli are frequently carried on the body of the fly, from excreta to food, and so gain entrance to the alimentary tract, there is no sufficient evidence to show that they are important causal agents in the spread of Enteric Fever in this country.

From the table it is seen that the greatest numbers of flies were caught when the Diarrhœa death-rate was at its height, in the week ending on the 29th August In the fourth week after this the Enteric attacks rose in number.

Probably similar meteorological conditions are favourable to flies and the causal conditions of fatal Diarrhœa and Typhoid Fever.

The following table exhibits the facts collected in reference to the relation between the occurrence of Enteric Fever and the antecedent consumption of shellfish.

Table of Enteric cases, in which there is a history of shell-fish eating :—

Case	Age	Sex	Variety	Raw	Cooked	Others partaking	Date of Onset	Interval in days	Remarks
*6	29	f.	Oysters	+		Husband	4th Jan.	1 day	
9	8	f.	Cockles		+	Mother, Father	6th Jan.	9 days	
10	40	m.	?	+		.....	9th Jan.	On same day	
29	29	m.	Whelks		+	.....	13th Jan.	14-20 days	Widal incomplete
*40	24	f.	Mussels		+	Husband	15th Feb.	56 days	
51	35	m.	Mussels	+	+	.....	20th Feb.	Partook frequently	
54	13	m.	Cockles	+		Father	20th Feb.	16 days	
55	24	m.	Mussels	+		.....	18th Feb.	18 or 25 days	
59	26	m.	Mussels	+		.....	27th Feb.	9 days	
63	23	m.	Mussels		+	.....	7th March	7, 14, or 21 days	
65	25	m.	Oysters	+		.....	15th March	1 day	
84	27	m.	Oysters	+		.....	25th March	3 days	
85	29	m.	Mussels	+		Wife	19th March	12 days	
99	12	m.	Mussels		+	Family	23rd March	5 days	
*100	46	m.	Oysters	+		.....	30th March	8 days	
115	34	m.	Mussels	+		.....	22nd April	Partook frequently	

* Indicates that patient died.

Case	Age	Sex	Variety	Raw	Cooked	Others partaking	Date of Onset	Interval in days	Remarks
127	33	m.	Oysters	+		.....	7th May	5 weeks	
*150	22	m.	Mussels	+	+	.....	27th May	Partook frequently	
151	21	m.	Mussels, Whelks, Periwinkles		+	Family	19th May	3 days	
153	20	m.	?	+		.....	26th May	4 weeks	No blood specimen taken
157	25	m.	Mussels	+		.....	2nd June	Occasionally partook	
*166	23	m.	Mussels	+		.....	21st June	7 days	
178	23	m.	Mussels	+		Brother	19th June	20 days	
180	26	m.	Oysters	+		.....	5th June	On same day	Felt unwell on 5th June. Headache 7th. Abdominal pain 10th. Doctor called in 28th. Widal positive 4th July
206	29	m.	?	+		.....	15th July	Partook often	
224	28	f.	Oysters	+		.....	10th August	7–14 days	
229	25	f.	Oysters	+		.....	24th August	20 days	Another man who partook at Blackpool was sick immediately after partaking
247	26	m.	Mussels	+		.....	14th Sept.	16 days	
251	22	f.	Mussels	+	+	Sister	21st Sept.	21 days	Partook frequently

* Indicates that patient died.

Case	Age	Sex	Variety	Raw	Cooked	Others partaking	Date of Onset	Interval in days	Remarks
254	20	m.	Mussels	+	+	Whole family	27th Sept.	4 days	
262	35	m.	Mussels	+		Two others	1st Oct.	7 days	Partook frequently
263	32	m.	?	+		.....	18th Sept.	6	
268	39	m.	?	+		Wife and two children	1st Sept.	13	
*269	22	m.	?	+	+	.....	14th Sept.	2	Partook recently
293	59	m.	?		+	.....	27th Sept.	1	
275	43	m.	Cockles, oysters	+		Family took the cockles	2nd Oct.	Cockles, 19 days Oysters, 5 days	Cockles gathered on the sands at Blackpool
276	16	m.	Mussels	+		Friend	9th Oct.	6	
*283	31	m.	?		+	Both and others partook	12th Oct.	5	Lived 8 days. Death certificate, Enteric Fever and Pericarditis. Widal negative. Blood taken on 9th day of illness
*284	10	m.			+		17th Oct.	10	Patients slept together
*287	22	f.	?		+	Whole family	14th Oct.	5	
*292	30	m.	Oysters, mussels	+	+	.....	3rd Oct.	21	
262	35	m.	Mussels	+		Two others	1st Oct.	7	Partook frequently

* Indicates that patient died.

Case	Age	Sex	Variety	Raw	Cooked	Others partaking	Date of Onset	Interval in days	Remarks
*295	20	f.	Mussels	+		.....	4th Oct.	Took them frequently	
303	13	f.	Cockles		+	.....	15th Oct.	14	
*304	12	f.	Mussels		+	.....	1st Oct.	13	
*307	26	m.	Oysters & cockles	+	+	The whole family partook of the cockles	25th Oct.	Dates uncertain. Had cockles the day before he took ill	Lived only 6 days. Widal negative
358	28	f.	Mussels		+	Whole family	23rd Nov.	6	
360	47	m.	Mussels		+	.....	13th Nov.	9	
364	20	m.	Mussels	+		.....	20th Nov.	2	
365	33	m.	Mussels		+	Wife	18th Nov.	About a month	
370	21	m.	Mussels	+		.....	2nd Dec.	About a month	Widal negative. 2nd specimen not taken
386	28	m.	1 Oyster raw, Mussels		+	.....	8th Dec.	17	
393	28	m.	Mussels		+	Wife	12th Dec.	7	

* Indicates that patient died.

In 52 cases (13 per cent.) a history of shellfish eating has been elicited. Twenty-eight cases had the shellfish raw, 17 cooked, and 7 both raw and cooked. In 21 cases the patient was known to be in company, when he partook, with some friends or relations who had shellfish at the same time. In all cases, with one exception (cases 283 and 284), these friends remained healthy. In some of the cases it may be objected that the interval between the partaking of the shellfish and the onset of the disease is so short that it is doubtful if the shellfish eating could possibly be a causal condition in these. These cases have been, as usual, reported because immediate illness may occur from shellfish eating which may be followed later by true Enteric Fever. In such the onset in the immediate illness may be mistaken for the later onset of the Enteric Fever. Thus, case 180 took raw oysters on 5th June. He felt unwell on the same day, had headache on the 7th, abdominal pain on the 10th, called in a doctor on the 28th, blood gave a positive Widal reaction on the 4th July. Some long interval cases have been noted, as the onset is, at times, very insidious.

If shellfish infected by Eberth's bacillus are the cause of many cases of Typhoid Fever, then it should follow that a rise in the number of cases infected on any date in this manner should immediately follow the autumnal rise of Enteric Fever in the various estuaries from which shellfish come, provided that the consumption is fairly constant.

The dates are given when shellfish which are supposed to have given rise to infection were partaken of from August to November:—

August 4th, 19th, 29th, 31st, 31st.

September 12th, 12th, 19th, 20th, 21st, 23rd, 24th, 25th, 26th.

October 1st, 7th, 7th, 9th, 11th, 18th.

November 2nd, 4th, 17th, 20th, 21st.

The week of greatest incidence of infection is that ending on the 26th September. This is late in the season, and probably follows the rise of the

Enteric Fever curve in most districts, although it is coincident with that of Manchester.

Probably, in the near future, the public will be protected against infected shellfish. Means by which this object can be accomplished are suggested in the Report of the Commission on Sewage Disposal. The various water-sheds are to be placed under River Boards, consisting of Joint Committees of County Councils. These, with the assistance of a skilled Inspector, while enforcing the provisions of the Rivers Pollution Prevention Act, will register all layings from which shellfish are sent to the market, will define prohibited areas of foreshore, and will consider the best means of protecting consumers.

The work of the Rivers Boards will not be easy. They have not only to be acquainted with the relative positions of sewage outfalls and beds, but have to consider tidal and other currents increasing or lessening the danger of pollution. Bacteriological reports will probably increase their difficulties. When one reads in the evidence (1) that B. coli or coli-like microbes closely allied to it are generally present in 10 c.c. and sometimes 1 c.c. of some of the best estuary waters in which oysters are grown and fattened, and that B. Enteritidis sporogenes is by no means uniformly absent, (2) that sufficient evidence as to the power of shellfish to free themselves from pollution when placed in fresh water has not accumulated, and (3) that purified sewage contains organisms of intestinal origin, one is driven to the conclusion that the registration of layings in estuaries, the banks of which are populated to any extent, is dangerous.

If stringent rules removing all possibility of danger are laid down, then a trade in which considerable capital is employed, and which employs a considerable number of people, will be crippled; on the other hand, many Enteric attacks and deaths will be saved, and an expensive food stuff of little nutritive value will be made dearer.

As in former Annual Reports, a list of cases is given in which direct infection is probable. (See tables on following pages.)

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
†1	48	m.	30	Case 349/02 was in the same house for the first twelve days of his illness	6/4	6	8 adults, 1 child	Pail-closet 6 feet distant	
2	31	f.	13th December	Daughter, 7, died on December 13th of Pneumonia	4/4	2	2 adults, 2 children	W. C.	
†15	48	f.	8th January 111 days	Sister case 254, nursed by patient up to 25th December, 1902, at her home					
				Dates of removal to hospital :					
5	36	f.	29th December	13th January					
32	22	m.	29th January	14th January	5/3	6	5 adults, 4 children	Pail-closet adjoining	Case 32 was sent to Ancoats Hospital, said to be suffering from Consumption, on 14th January.
42	33	f.	12th February	26th February					
52	12	m.	24th February	9th March					
78	37	m.	11th March	23rd March					
				Case 297. Onset 11th October, 1902. Was nursed at home. (10 B. L.)					
45	18	f.	13th February	Visited 10 (B. L.) 3 weeks before onset to see her companion there					
37	25	f.	9th February	Nursed a Stretford case from 31st January to 14th February					
				To Monsall :					
48	5	m.	16th February	5th March	4/-	4	4 adults, 6 children	Pail-closet 8 feet away	
49	7	m.	22nd February	6th March					
107	10	f.	5th April						
				Brother, case 30. Onset 29th Jan., Monsall 13th Feb., discharged 7th April					

* The number in the house includes all infected but not the infecting case. † Died.

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
				Date of removal to hospital					
60	31	f.	15th Feb.	12th March — From overlooked case 132 Onset about a fortnight before the mother, case 60	5/-	4	2 adults, 5 children	Pail 5 feet distant	
61	10	f.	4th March	12th March					
				To Monsall					
44	9	m.	15th Feb.	26th Feb. — From case 378/02. Onset, 6th December. Monsall: Admitted 17th December; Discharged 6th March.	4/6	4	3 adults, 3 children	W.C.	
68	16	f.	14th March	26th March					
81	6	f.	17th March	2nd April					
69	2	m.	15 days	Infected by father (case 66)	3/10	4	1 adult, 1 child	Midden adjoins	
75	20	m.	24th Feb.	Case 239/02. Brother. Onset, 1st Sept. Monsall: Admitted 26th September. Discharged 2nd December.	7/-	6	7 adults, 4 children	Pail-closet 5 feet distant	Cellar-yard drains defective. No typhoid bacilli in 239's urine after discharge from hospital
†77	15	f.	14 days	Brother, case 53. Onset, 23rd Feb.	4/6	4	5 adults, 2 children	Pail-closet adjoining	
†93	16	m.	1st April	Unknown source	...	...	... ...	W.C.	Both worked in Bradford post office
94	15	m.	4th April						

* The number in the house includes all infected, but not the infected cases. † Died.

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
98	5	m.	7th April	Mother, case 97. Ill health since her confinement, Dec. 1902. Severe cold early in March. 6th April, shivering and feverish	4/6	4	1 adult, 4 children	Pail-closet 14 feet distant	Filthy water near the house. Yard drains defective
112	28	f.	12th April	Son, case 117. Measles at beginning of March. which illness merged into Typhoid	4/9	4	2 adults, 2 children	Pail-closet 6 feet distant	Condition of yard bad
119	3	m.	27th April						
33	64	f.	2nd Feb.	Nursed son, who died of Enteric on 13th January at another address	9/6	7	3 adults	W.C. adjoining	
133	28	f.	21st May	Nursed case 33 at her home					
162	5	m.	About 9 days	Mother, case 148. Died	7/6	6	3 adults, 2 children	Pail-closet adjoins	
165	15	f.	10th June	Brother, case 120, took ill on 30th April. admitted to Monsall 9th May; discharged 23rd June	7/-	5	6 adults, 5 children	Midden 20 feet distant	House in bad repair. Case 214 frequently in the house of cases 120 and 194, where he occasionally had food
194	19	f.	3rd July	Case 165. Admitted to Monsall 24th June					
214	6	m.	30th July	Playmate of case 120. Case 194, to Monsall 20th July					
185	63	f.	38 days	Nursed daughter, case 58, at another address	4/9	4	2 adults, 1 child	Pail-closet adjoining	Washed her daughter's linen
†202	29	m.	30 days	Brother, case 178, whom patient nursed until the 16th day of his brother's illness	5/9	4	4 adults, 1 child	W. C. adjoining	
216	13	m.	12 days	Father, case 209	...	...	...	...	Drains bad at previous address where he was infected

* The number in the house includes all infected, but not the infected cases. † Died.

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	Number in the house *	Closets	Remarks
†219	7	f.	2nd August	44, William Street, Hulme	5/-	4	2 adults, 2 children	Pail-closet 6 feet distant	Patients were brother and sister. Probably they had the same source of infection as case 210 at 40, William Street
220	11	m.	4th August						
210	13	f.	29th July	40, William Street, Hulme	5/-	4	2 adults, 4 children	Pail-closet adjoining	
225	10	f.	17th August						
222	7	f.	25 days	Father, case 206. Went to hospital 10 days before onset in the daughter	4/6	4	1 adult, 4 children	Pail-closet 6 feet	Case 222 kept away from 206 and touched nothing from his room
261	3	m.	18th Sept.	Mother, case 175. Onset 15th June. Monsall admitted 3rd July: discharged 11th August	4/9	4	1 adult, 3 children	Pail-closet 4 feet distant	No Typhoid bacillus found in urine of case 175, but great numbers of a bacillus of the colon group present in middle of October House dirty
280	18	f.	10th Oct.	Brother. Sister	...	...	.....	.....	Probably there was a common source of infection. Uncle died 19th October from pneumonia; Aunt 21st October from Pulmonary Tuberculosis. These did not live in the same house
281	12	m.	10th Oct.						

* The number in the house includes all infected but not the infecting case. † Died.

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
†284	10	m.	17th Oct.	Case 283†. Slept in same room whose serum test was negative. Died from pericarditis and enteric fever. Onset 12th October	7/3	4	3 adults, 2 children	Pail-closet 5 feet distant	History of shellfish eating
290	32	f.	28th Sept.	Nursed case 238 for a few days before he was sent to hospital. Onset 25th August. Monsall 7th September	3/6	3	5 adults	Pail-closet 6 feet distant	Case 238 did not live at the same address
294	19/12	f.	7	Mother, case 288.† Died on the 16th day of illness	6/-	5	1 adult, 1 child	Pail-closet adjoining	House dirty
316	6	f.	30th Sept.	Sister, case 297, had onset on 22nd Sept.	4/6	4	5 adults, 1 child	Pail-closet 6 feet distant	
298	19	f.	14th Oct.						
332	43	m.	18th Oct.	Case 319 took ill about the beginning of October and was not notified until 10th November. All the cases were in contact, and partook of the same food.	5/9	6	5 adults, 4 children	W.C. adjoining	In case 332 2 serum tests were negative
320	15	m.	30th Oct.						
321	18	f.	2nd Nov.						
322	10	m.	9th Nov.						
323	35	f.	10th Nov.						
342	21	f.	29th Oct.	This patient nursed her sister, a Failsworth case,† on the night of the 21st October. They were also in contact on the 23rd October					

* The number in the house includes all infected but not the infecting case. † Dead.

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
343	4	m.	13th Nov.	Case 302 took ill on 16th October	4/-	3	2 adults, 4 children	Pail-closet adjoining	
357	2	m.	21st Nov.						
372	6	f.	28th Nov.						
373	32	f.	8th Dec.						
345	8	m.	9th Nov.	Infected by case 362, an overlooked case, who had its onset at the end of September	5/3	4	2 adults, 3 children	W.C. adjoining	
349	4	f.	11th Nov.						
352	16	f.	18th Nov.	Case 317 had onset on the 9th October, and was removed to Monsall on 20th October	4/-	3	2 adults, 1 child	W.C. adjoining	Cases 352 and 317 ate and slept together
353	8	m.	18th Nov.	Patient helped to nurse his brother, case 309. Onset 14th October. To Monsall 3rd November	4/3	4	3 adults, 1 child	W.C.	
355	9	m.	26th Nov.	Patient played, up to time of her removal, with sister, case 327. Onset 6th November; Monsall 13th November	5/6	4	2 adults, 4 children	W. C. adjoining	
366	4	f.	30th Nov.	All the cases occurred in one house. Probably the first 3 had a common origin	4/6	4	2 adults, 2 children	W. C. 8 feet distant	Serum tests in Case 397 negative. Second blood sample was taken on the 29th December.
367	7	f.	1st Dec.						
368	29	f.	3rd Dec.						
397	29	m.	19th Dec.						

Case No.	Age	Sex	Interval between onsets or their dates	Source of Infection	Rent	Number of Rooms	* Number in the house	Closets	Remarks
369	4	f.	27th Nov.	Her Aunt, a Stretford case, removed on 10th December to hospital Her mother visited patient's aunt.	...	.....	.....	.....	Milk supply the same in case 369 and in the Stretford case
371	28	f.	9th Dec.	Patient is a district nurse, and visited many Enteric cases in Outer Gorton					
374	11	m.	5th Dec.	Brother, case 359. Took ill on the 31st October, and was admitted to Crumpsall on the 30th November	4/6	2	2 adults, 2 children	W. C. adjoining	
377	10	m.	5th Dec.						
380	6	f.	6th Dec.	Brother, case 337†. Onset 10th November; to Monsall 21st November	4/6	4	2 adults, 2 children	Pail-closet adjoining	380 and 337 slept together until 337 took ill.
308	11	m.	20th Oct.	Lived near other cases	...	.....	.. ...	.....	337, 341, 380, 308, all lived in the vicinity of Murphy's marine store
341	28	f.	6th Nov.	This patient lived next door to 337					
381	22	f.	7th Dec.	Infected by son, case 387, who during November suffered from Consumption of the Bowels and Diarrhœa, but later his blood gave a Widal reaction	6/-	4	3 adults, 1 child	Pail-closet adjoining	
†400	48	f.	22nd Dec.						
395	26	f.	9th Dec.	Husband, case 346†. Was nursed at home. Onset 28th Oct. Death 2nd Dec.	6/4	6	8 adults	Pail-closet	

* The number in the house includes all infected but not the infecting case. † Died.

The following cases were infected outside Manchester :—

Case	Where infected	Remarks
36	Lichfield	Came to Manchester on 7th February. Appeared well up to 17th February, when he was found dead. Notified by the Coroner.
37	Stretford	Nursed a case of Enteric Fever there from 31st January to 14th February. Onset, 9th February.
74	Wolverhampton	Patient was a tramp, who lived three days at a Manchester common lodging-house. He came there from Wolverhampton, where he had been working.
148	Southport	Patient was a barmaid in a Southport hotel. She came home when she took ill.
224	Cleethorpes	On holiday at Cleethorpes from 27th July to 3rd August. Onset, August 10th.
342	Failsworth	Nursed a Failsworth case (her sister) on 21st and 23rd October. Onset, 29th October.
371	Outer Gorton	District nurse, attending Enteric cases in Outer Gorton.

BACTERIOLOGICAL EXAMINATIONS.

The following is a tabulated statement of the result of the bacteriological examination made by Professor Delépine of specimens of blood taken from suspected cases of Enteric Fever :—

Number of Cases submitted to Examination	Collected by Medical Practitioners					Collected in Monsall Hospital								
	Positive Reaction	Negative Adheres	Negative Accepts	Duplicate and Control Specimens		Positive Reaction	Negative Adheres	Negative Accepts	Duplicate and Control Specimens		Cases from Outside Districts		Staff	
				Positive	Negative				Positive	Negative	Positive	Negative	Positive	Negative
751	*283	33	284	5	38	47	5	12	14	16	1	0	9	4

* Six of these were collected at Withington Workhouse Hospital.

It will be noted that in a certain number of the cases it is necessary to take further specimens, either on account of the want of definiteness in the reaction from the first specimen, or because the case presented features of Enteric Fever which made it desirable to have as much certainty as could be secured in regard to the nature of the illness.

These cases from outside the hospital number 43, of which only 5 subsequently gave a positive reaction. The corresponding figures for Monsall do not, probably, have quite the same significance.

D. Forbes, M.D.

MEASLES.

The following are the usual annual tables relating to Measles. It will be remembered that the Education Authority has hitherto furnished to the Medical Officer of Health a daily list of all cases of Measles coming to their knowledge. The homes of these cases are visited by the Sanitary Inspectors, who instruct the relatives in the precautions to be taken, and attend to any sanitary defects found. No schools or parts of schools were closed by the Sanitary Authority during 1903.

From both Measles and Whooping Cough in 1903 the death-rate was under the average of the preceding 10 years, being highest in the case of Measles in North Manchester, and in the case of Whooping Cough in the Manchester Township. The death-rate from Measles is, however, higher than in any one of the previous three years.

The districts in which Measles exacted the highest death-rate were Ancoats, Central, St. George's, Hulme, Rusholme, and West Gorton.

The number of Schools having over 10 per cent. of the average attendance affected at some period of the year, distributed in districts, was as follows :—

	Total	Percentage Absent at one time				
		10—	20—	30—	40—	50—
Ancoats	1	1	...	...	...	...
Central	4	3	1	...	...	...
St. George's	1	1	...	...	...	...
Cheetham	3	2	...	1	...	...
Crumpsall	4	1	2	1	...	...
Blackley	...	...	...	...	...	...
Harpurhey	...	...	...	...	...	...
Moston	...	...	...	...	...	...
Newton	5	...	1	2	2	...
Bradford	...	...	...	...	...	...
Beswick	1	1	...	...	...	...
Clayton	...	...	...	...	...	...
Ardwick	2	1	1	...	...	...
Openshaw	1	1	...	...	...	...
West Gorton	4	3	1	...	...	...
Rusholme	3	1	2	...	...	...
Chorlton-upon-Medlock	7	3	3	...	...	1
Hulme	8	7	1	...	...	...
Total	44	25	12	4	2	1

The following are the rates of mortality for 1903, compared with the mean of the previous five years:—

1903.—Measles Mortality.—Rate per 1000 living, compared with mean of five years.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales	0·41	0·31	0·39	0·27	0·38	**0·35**	0·27
*76 Great Towns	0·56	0·46	0·43	0·43	0·49	**0·47**	0·36
London	0·69	0·47	0·42	0·43	0·51	**0·50**	0·45
City of Manchester...	0·50	1·28	0·47	0·53	0·44	**0·64**	0·62
Manchester Township ...	0·48	2·35	0·37	0·58	0·44	**0·84**	0·96
North Manchester	0·56	1·22	0·53	0·29	0·67	**0·65**	0·34
South Manchester	0·48	0·71	0·48	0·68	0·29	**0·53**	0·64
*103 Smaller Towns	0·41	0·28	0·51	0·25	0·37	**0·36**	0·29
Rural Districts	0·31	0·21	0·32	0·17	0·27	**0·26**	0·17

*The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns.

The deaths from Measles in districts are as follows:—

1903—Deaths and Death-rates from Measles in the various divisions of the City.

Statistical Divisions	Estimated Population	Deaths	Death-rate
City of Manchester	**554,331**	**345**	**0·62**
I. Manchester Township ...	132,160	127	0·96
II. North Manchester.....	172,289	58	0·34
III. South Manchester.....	249,882	160	0·64
I. Ancoats	44,437	51	1·15
I. Central	28,525	30	1·05
I. St. George's	59,198	46	0·78
II. Cheetham	38,778	8	0·21
II. Crumpsall	9,051	2	0·22
II. Blackley.....	9,174	5	0·55
II. Harpurhey	17,809	3	0·17
II. Moston	14,241	5	0·35
II. Newton Heath	37,143	20	0·54
II. Bradford	24,311	8	0·33
II. Beswick	11,987	5	0·42
II. Clayton	9,795	2	0·20
III. Ardwick	42,618	22	0·52
III. Openshaw	27,890	7	0·25
III. Gorton (West)	30,315	19	0·63
III. Rusholme and Kirk.....	25,533	21	0·82
III. Chorlton-upon-Medlock..	57,398	33	0·57
III. Hulme	66,128	58	0·88

1903.—Measles.—Deaths in Quarters in the City and in Groups of Districts.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	158	104	54	29
Manchester Township ...	58	38	19	12
North Manchester	17	18	16	7
South Manchester	83	48	19	10

This is the most fatal of the zymotic diseases after summer Diarrhœa. During the ten years preceding 1903 the number of deaths was considerably in excess of those from Scarlet Fever, Diphtheria, Enteric Fever, and Small-pox combined. It spreads rapidly from one part of a district to another. In smaller places it thus happens that every two years there is a great increase in the mortality. This does not hold in Manchester, however, which is too large to be overtaken in the course of one year. It is possible also that the greater attention given to the disease has to a considerable extent modified its ordinary habit. The rapidity with which it spreads from child to child in the Infant Departments of Schools is a fact too conspicuous to be overlooked. But when we analyse its progression in different and adjoining districts of the City, we see that even in centrally placed adjoining districts the waves have different starting and culminating points.

It is probable that these differences are determined by the different periods at which Schools in the different districts act as *foci* of infection, and that outside the school the impediments to infection are much greater than inside the school. (See Annual Report for 1898.)

It is a singular fact that the disease had a maximum mortality in the Manchester Townships in 1892, 1896, 1899, and 1903, that is at intervals of about four years; in North Manchester in 1893, 1896, 1899, and 1902, that is at intervals of three years; and in South Manchester in 1895, 1897, 1899, 1901, and possibly in 1903, at intervals of two years. There would appear to be here influences at work other than the epidemic habit of the disease.

It is possible that the perturbations introduced by Salford on the west, and by Oldham on the east, affect the period, but the differences may also be in part due to internal cleavages.

These differences cannot in themselves be taken as any indication of the rapidity of propagation outside the Schools. To obtain an idea of this we must study the behaviour of Sanitary Districts in the interior of the City.

Take for example the two districts of Bradford and Beswick. Roughly, Bradford should have twice as many deaths from Measles as Beswick, supposing the two districts to be simultaneously and equally affected. It may be taken that there is no great difference in the class of the inhabitants

No. of Deaths	1895	1896	1897	1898	1899	1900	1901	1902	1903
Bradford	15	60	10	41	42	37	10	18	8
Beswick	13	8	7	15	13	10	2	17	5

We see that the variations in Beswick are much less marked than in Bradford if we except the year 1901. That, however, there is a general tendency for the two to rise and fall together is evident; yet a severe outburst can occur in Bradford, as in 1896, without extending into Beswick, while the comparatively severe incidence on Beswick of 1902 is not accompanied by a corresponding incidence on Bradford. There are clearly local *foci* which produce considerable effects in one district, without corresponding extension into the other.

These *foci*, generally speaking, are in the Infant Departments of Schools. It has been previously shown that this Department in one School may be severely visited without a corresponding effect on that of an adjoining School.

Since this section of the Report was written, I have been instructed by the Hospitals Sub-Committee to report on the prevalence of Measles, and, in accordance with a resolution passed by them, the report presented is inserted here :—

Public Health Office,
Town Hall, Manchester,
June 6th, 1904.

To the Chairman of the Hospitals Sub-Committee.

The Medical Officer of Health begs to report on Measles in accordance with the resolution of the Hospitals Sub-Committee of May 16th.

The disease is highly infectious.

Infectious in the prodromal stage

Between the reception of the infection and the subsequent appearance of eruption in the person infected, the period is about 16 days on an average. It is highly infectious in the period immediately following the beginning of illness and antecedent to the appearance of the eruption, which may be taken at three days. During this period the person affected may suffer from running at the eyes, sneezing, a soft husky cough, and some fever, symptoms simulating the onset of an acute cold. But any of these preliminary symptoms may be absent.

Period of the disease at which death occurs

The disease varies greatly in severity like Scarlet Fever and Diphtheria. A large proportion of the deaths occurs within the first fortnight after appearance of the eruption, indicating that the cause of death has been the intensity of the infection rather than any consequent affection.

Complications and sequelæ

Croup is apt to occur, and Broncho Pneumonia is a common feature of the disease. Suppuration in the middle ear not infrequently ensues.

But the most serious result of Measles is the great tendency to Tuberculosis following an attack.

High mortality

At the same time it is a very fatal disease, apart from any sequelæ.

History of mortality in England

The mortality from Measles in England and Wales has not altered within the last fifty years.

In Manchester

In the present City of Manchester our facts do not extend further back than 1891, but for the three Unions of Manchester, Chorlton, and Prestwich, embracing a population which is mainly that of Manchester, the death-rate from Measles is given in five yearly periods since 1871. The figures are—

Years	1871-75	1876-80	1881-85	1886-90	1891-95	1896-1900
Death-rate from Measles	0·64	0·53	0·71	0·83	0·62	0·89

We thus see that the death-rate was highest in the last complete quinquennium, and that there is shown a general tendency towards increase.

The annual death-rates from Measles since 1891 at ages under 5 were as follows :—

DEATH-RATES FROM MEASLES AND FROM ALL CAUSES UNDER 5 YEARS OF AGE.

	1891	1892	1893	1894	1895	1896	1897
Measles	3·26	5·50	4·40	3·24	7·53	8·48	9·35
All causes	86·6	78·7	86·3	66·5	90·7	80·4	85·3

	1898	1899	1900	1901	1902	1903	
Measles	4·02	10·31	3·66	4·29	3·51	5·13	...
All causes	78·1	87·5	78·3	74·5	64·7	69·5	...

Recent history

It will be seen that a severe outburst began in 1895, and lasted for five years.

At the age group 0—4 the deaths from Measles in 1899 were over 1 to 8 deaths from other causes.

Comparison of mortality with that from other infectious diseases

A comparison of the mortality due to Measles with that caused by other zymotic diseases, and with Phthisis, is given in the following figures :—

No. of Deaths from	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903
Measles	220	369	293	222	505	567	628	271	699	254	292	242	345
Scarlet Fever	114	130	140	116	173	198	124	65	46	105	127	146	97
Diphtheria	122	91	122	102	72	54	29	41	71	76	133	123	136
Enteric Fever	189	124	127	91	95	118	95	120	73	75	75	66	93
Smallpox	0	2	49	21	2	0	0	0	0	0	0	0	24
Whooping Cough.....	518	368	240	286	250	359	299	170	227	371	224	242	213
Diarrhœa, &c.....	432	418	956	375	904	572	964	1090	1121	822	1019	296	507
Phthisis.....	1117	1053	1060	1026	1139	1078	1139	1056	1117	1135	1144	1145	1025

We thus see how greatly the mortality from Measles exceeds that from Scarlet Fever, Diphtheria, or Enteric Fever.

In 1897 and 1899 the deaths from Measles exceeded in number those from all these fevers, with Whooping Cough added.

Spreads rapidly in schools

The disease sweeps rapidly through the infant departments of schools, but extends, as a rule, much less readily through the more advanced classes.

Age incidence of attacks

I have no data to show at what age the number of cases of Measles is greatest, but having regard to the large numbers attacked in the infant departments of schools, many of whom, however, may undergo a second attack under the intense exposure, it is probable that the highest attack rate is at the ages four to six. Information on this point is given in the Report by Dr. Theodore Thomson to the Local Government Board.

Children under one year of age are probably not attacked in so high a proportion as older children.

The greatest fatality occurs in the second year of life.

The number of deaths over the age of 5 is small.

The extent to which the mortality falls on diffierent ages may be shown by taking the deaths for five years, 1895-99, and adding them together, thus :—

DEATHS FROM MEASLES, 1895-99.

Age incidence of mortality

Under one year								
Under 3 Months	3—5 Months	6—11 Months	Total under one year	Years 1 —	2 —	3 —	4 —	Total at 5 years and upwards
14	43	521	578	1091	493	257	125	136

Inasmuch as it is probable that the fatality diminishes rapidly from infancy, taken on a sufficient number of particulars, it would seem that infants very largely escape. Infants are probably protected partly by insusceptibility, but partly by the circumstance that, when there is one infant in the house, it runs but little risk of attack.

The disease, usually, comes into the house through the older children, and especially from the school.

It is seen from the above figures to be a matter of the greatest importance to keep Measles excluded from the house so long as the children are yet very young.

Schools largely responsible for the spread of Measles

It will be seen also that, though the schools are chiefly responsible for the rapid extension of Measles, the brunt of the mortality does not fall on these school children, but on younger members of the family.

It is probable that the mortality is increased by reason of this fact. If a child contracts the disease from a playmate outside, he will probably receive a smaller dose of infection than he will receive from an older brother or sister attacked at school with whom he is brought into intimate contact inside the house.

The mortality is probably kept up in this way

It is, however, necessary that we should ask ourselves whether the extension in school can be avoided. If we save the infant departments, will the children who have escaped not contract the disease when older, and thus dislocate education still further?

It is impossible to answer this question satisfactorily. We do not know. From a consideration, however, of the age incidence of the different infectious diseases, it is probable that the disease would fall on later ages with an increased incidence, but not equal to that with which it now falls on infant classes. Moreover, any measure effective for the junior classes would be effective for the seniors.

Various administrative measures have been adopted, mostly in vain, in the effort to prevent the extension of the disease.

Administrative measures tried

They may thus be enumerated :—

Compulsory notification.

Hospital isolation.

Closing of schools.

Closing of the infant departments of schools.

Notification of individual cases by the School Authorities, with exclusion of scholars from the affected households.

Other measures.

It cannot be said that compulsory notification has been a success, and many authorities who have tried it have given it up. This has arisen chiefly from the difficulty in preventing the disease from extending. A considerable expense has thus been incurred, without corresponding advantage.

Reasons for partial failure of compulsory notification

In the course of an investigation into an extensive and very fatal outbreak in Blackburn, Dr. Wheatley showed that only about half the cases came under medical supervision.

It is no doubt the case that a very large proportion of the cases would thus come under the attention of the Sanitary Authority, but to utilise the material adequately would require a considerable addition to the Sanitary staff; and, even then, to obtain complete efficiency, would further require a considerable amount of isolation in hospital.

Some hospital isolation needed to protect institutions

2. *Hospital isolation.*—Although it is desirable that a certain amount of hospital isolation should be provided, the manner in which the disease terminates fatally does not lead us to expect that a great saving of life would result, and it is only as a life-saving institution, and not as a means of preventing the extension of the disease, that we could expect a hospital to be useful in a large city, at all events under existing conditions.

Closing of the infant departments of schools

3. When we were assailed in 1895 and 1896 by an exceptionally severe and rapidly spreading form of Measles, we endeavoured to meet it by closing schools, and, after some little time, by closing only the infant department of schools. This measure was, however, the result of the severe outbreak, and did not precede it.

Useful, though inadequate to prevent widespread extension

It was shown that when the number of cases in an infant department reached 10 per cent. of the average attendance, it sufficed almost invariably to arrest the extension of the disease in that department to close the department for three weeks.

It was further shown that the attendance was not materially affected when the department was re-opened. Sunday schools were closed, and the children belonging to the closed departments of day schools were prevented from going to other schools.

At the same time, cases of Measles occurring in school were notified by the School Board to the Public Health Office, a Sanitary Inspector called at the house, and gave the parents both written and verbal instructions in the precautions to be taken. The remaining children attending school were excluded for a period of four weeks.

By these measures, although they were plainly insufficient to prevent the disease from spreading, it was believed that the epidemic was diffused over a greater period of time, while, in all probability, the mortality was diminished.

In favour of closing infant departments of schools when the number of cases reached 10 per cent of the average, these were the reasons adduced.

The disease spreads rapidly through the infant departments, and usually affects the older children to a much slighter extent.

Not infrequently one school in a district was found to be severely affected, while others in the same district were slightly affected, thus showing that the school is a centre of infection.

Closing the infant department for three weeks almost invariably arrested the course of the outbreak in the particular school, and to that extent delayed the spread of the disease, since, if the remaining children in the department were thus protected, still more would protection be afforded to children at other schools and at home.

Closing cannot be regarded as seriously interfering with education

It cannot be said that closing the infant department of a school interferes materially with education. Indeed Dr. Newsholme, of Brighton, a recognised authority, considers, on various grounds, that children should not be sent to school at all till they are seven years old, and he does not stand alone in that contention.

The facts given above do not, in my opinion, accord with the view that closing the infant department of a school in a large town is of little or no use as compared with the same procedure in the country, showing, as they do, that the disease does not spread nearly so readily outside as in the school.

Objections raised to closing departments of schools

Against closing the infant department of schools it has been urged that education is thus interfered with, that the progress of the disease is not in this way impeded, that the children are not so well cared for as while they are attending school, that the older scholars are taken away from the senior classes to look after the excluded juniors, and that the attendances on re-opening the department are found to have fallen off.

There is, however, only one of these statements to which no reply can be given, viz., that the children are not so well cared for at home as while attending school.

No special investigation has been made into this point, and it is one on which an opinion must be given guardedly. It may be true, and yet the disadvantage must be much less than exposure to the accumulated infection from many affected children.

Further, it does not appear reasonable that children should be exposed to attack from a rapidly spreading disease without any intimation to parents of the danger, or opportunity to remove the children attending school, although there may be two or three younger children at home to whom the disease may prove fatal.

Our experience did not show that the attendances at school when reopened were diminished, nor was there reason to suppose that the senior scholars were kept at home to any material extent.

Sanitary Committee decline to continue closing schools

The Sanitary Committee, however, having in view that the epidemic of Measles had not been even approximately arrested by the closing of schools in 1899, and at the repeated insistence of the School Board, decided in 1900 not to continue the policy of closing schools.

As a matter of fact, for some years there was, subsequently, a great diminution in the incidence of Measles, just as there was in districts in which schools had not been closed.

Increased information offered by the School Board

The School Board proffered to supply the Public Health Department with daily lists of scholars in the different schools found to be suffering from Measles, and this has been continued up to the present time. Every case thus notified is visited by a sanitary inspector, and special instructions are given. But the sanitary staff is inadequate to deal effectually with such a prevalence as has obtained for some time past.

Difficulty of closing schools has increased

A new element has been imported into the position by the Education Act, 1902, under which the grant is determined by attendances, absences owing to infectious disease not being allowed for.

There is thus an inducement not to search too eagerly for infectious disease, which must re-act on the value of the information given.

Possibly one may be too apprehensive on this score. But, whatever be the reason, Measles has again become more prevalent in 1903 and 1904, and in the former year there were no fewer than 44 schools in which over 10 per cent of the children in the infant departments were, at one or another time, affected.

Increased prevalence of Measles in 1903 and 1904

The facts may be thus presented for the year 1903 :—

Schools having 10 *per cent. and upwards of the average numbers attending the infant department affected with Measles at one time.*

Total	10 — per cent.	20 —	30 —	40 —	50 —
44	25	12	4	2	1

During the year 1903, from information supplied by Mr. Wyatt, it appears that the schools in which the children absent suffering from Measles from the infant department equalled or exceeded at one time 10 per cent. of the average attendance numbered no fewer than 44. Of these, the proportion absent at one time exceeded 10 per cent. in 25, 20 per cent. in 12, 30 per cent. in 4, 40 per cent. in 2, and 50 per cent. in 1.

The districts in which these schools were situated were :—

Manchester Township.—Ancoats, 1 ; Central, 4 ; St. George's, 1.

North Manchester.—Cheetham, 3 ; Crumpsall, 4 ; Newton, 5 ; Beswick, 1.

South Manchester.—Ardwick, 2 ; Openshaw, 1 ; West Gorton, 4 ; Rusholme, 3 ; Chorlton-upon-Medlock, 7 ; Hulme, 8.

Two of these schools are counted twice, viz., St. Andrew's, Homer Street, in which the infant department sustained two distinct invasions, one in January and one in November, and St. Thomas's Board School, Crumpsall, which was also twice invaded, once in February and again in December.

This is a sufficient answer to the objection raised against closing the department that the school was liable to sustain a second invasion. This occurrence is seen to be independent of closing.

In two schools the disease is spread over three months, during which time very few susceptible children can have escaped.

The death-rate in 1903 was highest in the Manchester Township, where it amounted to 0·96 per 1000, and next in South Manchester.

As regards particular districts, it was highest in Ancoats, Central, St. George's, Hulme, Rusholme, and West Gorton. There were thus at least three distinct centres.

The death-rates do not correspond closely to the number of schools invaded. They are determined, as we have seen, to no slight extent, by sanitary conditions.

The Manchester Township and South Manchester were affected in greatest degree in the first quarter of the year, while in North Manchester, which suffered comparatively little, the disease, so far as shown by the death-rates, was spread evenly over the first three quarters.

Discussion of the measures required in regard to Measles by the Society of Medical Officers of Health

The subject of the control of Measles was recently before the Incorporated Society of Medical Officers of Health, and the discussion illustrated the inadequacy of existing methods of coping with the disease.

Dr. Robinson, of Kent, it is true, claimed that the incidence of Measles had been greatly reduced in Dover under a system of compulsory notification; and Dr. Garstang, of Mid Cheshire, believed that he had on several occasions arrested an outbreak by closing schools and getting the schoolmaster or other efficient officer to act temporarily as a Sanitary Inspector, whose duty it was to visit the affected homes, and see that isolation was efficiently carried out.

It must be admitted, however, that, in the aggregate, we do not seem in the way to do anything effectual to control the disease.

In considering what might be done, we may go back to first principles.

Procedure necessary for complete control of the disease

If cases of Measles were compulsorily notifiable by the medical attendant and the householder, and if the same action were taken in the case of Measles as for Scarlet Fever, even apart from isolation in hospital, parents would come to learn the importance of dealing strictly with the disease. But many cases would escape recognition.

Even if all known cases were notified, seeing that the disease is highly infectious in the early stage, before the eruption has appeared, it would still spread in the school.

Notification from the school authority would still be necessary, in addition, since it is certain that many cases would come to their knowledge of which no medical attendant would be aware. But this is insufficient. As in connection with other matters, I have urged that it is only by training the school teachers practically in a knowledge of the conditions that we can make progress, so in the case of Measles and Whooping Cough we are and must remain largely dependent on this special training.

In particular, it is essential, once a case of Measles has appeared in a school (generally in the infant department), that the teachers should give their whole energies to the exclusion, especially in that department, of all children affected with catarrh or with any suspicious signs.

Were this rigorously carried out, much more might be done to arrest the spread of Measles than has yet been effected, especially if strenuous efforts were at the same time made to have the children excluded kept under observation, and effectually isolated if attacked.

Compulsory notification with consequent action, but without stringent care on the part of the schools, probably less effective than stringent action through the schools in the absence of notification

Every case of Measles notified should be visited by a Sanitary Inspector, and isolation, at all events to the house invaded, should be enforced as far as practicable.

It is probable that this would entail an increase of staff.

There would thus be the expense of notification and the expense of supervision.

But these additional charges would not be fully justified unless the Sanitary Authority is in a position to control the spread of the disease in schools.

Is the converse true, that without compulsory notification measures taken to control the spread of the disease by the schools must be equally inadequate?

This is probably not the case.

But in order to control the spread of the disease by the schools, it is necessary that known cases should be promptly reported by the teachers to

the Education Authority, and by the Education Authority to the Public Health Department, as is now done.

It is further necessary that these cases should be visited, and strict isolation advised. It will be noted that only advice can be given unless Measles is made compulsorily notifiable.

Action required at the schools

On the occurrence of a case of Measles in any department of a school, special daily examinations of the scholars should be instituted for a period of not less than 18 days, and all children suffering from suspicious symptoms, including catarrh, should be sent home until the dangerous period is overpast.

Should further cases occur in the school, a list of such cases might be posted, and a notice put up warning children of the danger of intercourse with the infected households.

Every effort should be made to ascertain which, if any, of the children come from a house already invaded by Measles in some person not attending school, and such children should be excluded.

If these measures proved inadequate, and the disease continued to spread, the department chiefly affected, and, where needful, the whole school, should be closed.

Dr. Garstang's action might be usefully followed, and the teachers might, during closure, visit at the homes of their scholars, and see that isolation was strictly carried out.

Further statutory powers required

On the other hand, a considerable proportion of the attacks occur under school age, and in not a few instances these children will be the first case in the house. If, in all such cases, the parents were under statutory obligation to notify the occurrence of an attack to the Master of the School, at which their older children are attending, the school might, in some cases, be protected from invasion. The notification of such cases could scarcely be made a local matter, and statutory powers would be required.

By the Public Health (London) Act, 1891, all or any of certain sections are applicable to dangerous infectious diseases, and Measles may be constituted by Order such a disease. It cannot be said, however, that very much is gained in the case of Measles.

The most valuable of these sections enacts that "Any person who, being in charge of any person suffering from a dangerous infective disease, exposes such person without proper precautions against spreading the disease in any street, public place, shop, or inn, shall be liable to a fine not exceeding five pounds."

There is needed power to exclude other children from an infected house, and in the above, after the word "inn," should be inserted: "or who fails, as far as practicable, to secure isolation of any person so suffering."

This expression would clearly cover keeping the door closed, and excluding other children.

Supposing, now, the above measures all to be adopted, including compulsory notification, and closing of the infant departments of schools, what would be the cost entailed under the heads of notification and staff?

Cost of a complete scheme

We will suppose that in any one year 400 deaths from Measles have occurred, and that the case fatality is 2 per cent. This means that 20,000 cases would occur. If we assume that only half of the total number would come to the knowledge of medical men, 10,000 cases would be notified, the expense of which would be £1,250. This expense would be greatly reduced if a fee was paid only in respect of the first case notified in a household.

Let us assume that six temporary Sanitary Inspectors, more or fewer according to the need, would be sufficient to do all the necessary work connected with notification at a cost of 40 shillings each per week, or less.

This would amount to £624, and the total charge would be £1,874 (supposing the inspectors required throughout a whole year, which would rarely be the case).

It is a considerable sum, but if notification were effectual it cannot be said that it would be excessive, having regard to the absences from school which are at present entailed, especially as, in case of a successful result, the expense would rapidly diminish.

No security on this point, however, can be promised. It is to be remembered that Manchester is surrounded with other communities, and that any action taken would have to be general.

The matter is, however, not concluded financially by such a statement.

Counter statement

No grants are now made by reason of absences from school on account of infectious disease, and if any effectual means could be devised for preventing the spread of Measles, a very large sum would be saved in school fees.

As already mentioned, by the revoking of section 101 of the Elementary School Code, the position as regards schools has been greatly altered.

It may be taken for granted that the Education Authority will not now willingly close a school, or a department, however desirable it may appear from a sanitary point of view. At all events, they will probably not do so as a settled policy without very strong reasons.

For complete control, special legislation required

Your Medical Officer of Health considers that owing to the special features attaching to the two diseases, Measles and Whooping Cough, general legislation of a special character would be required for their control.

Such legislation would embrace :—

Compulsory notification under special conditions.

The ordinary law relating to infectious disease, with the possible exceptions of disinfection and hospital provision.

A sufficient staff of inspectors.

Special provisions applicable to schools, such as the training of teachers in practical methods of dealing with these diseases, the daily systematic examination of scholars in invaded departments, the exclusion of children with suspicious symptoms, notification to the master by parents or guardians of any case occurring in their household, the circumstances under which schools or departments should be closed, and the action to be taken.

Short of such a general measure, it is difficult to see that much can be effected. The conditions under which school grants are given do not tend to stringency of exclusion from school.

Meanwhile, further information is required on a number of households invaded, with a view to determine when the disease ceases to be infectious, to what extent disinfection is called for, and how far, in the poorer districts, isolation can be enforced.

For this purpose the services of one or two special Sanitary Inspectors might usefully be made available.

Although, however, I consider that in order to establish complete control over Measles (and similarly over Whooping Cough) fresh legislation is required, there are certain steps which might at once be taken.

1.—Teachers might be instructed in the characteristics of these diseases, so far as is necessary for practical purposes.

2.—When Measles has invaded a school the teachers of the invaded department, usually the infant department, should be instructed to devote a part of each day to ascertaining whether any child is suffering from suspicious signs of illness, such as cough, sneezing, and running at the eyes, and any child so suffering should be sent home until the nature of the illness is cleared up. This might, at least, be made applicable to infant departments.

3.—On the invasion of any department of a school by Measles, all parents of children attending that department might be communicated with, and requested to send an intimation to school when Measles has occurred in any person in the household, whether attending school or not.

This, again, should be made to apply to the infant departments at least.

In this way an effort would be made to stay re-invasion of the department, owing to Measles having invaded the household otherwise than through the school. Notification by parents or guardians of cases of Measles or Whooping Cough occurring in the home, whether school children or not, should be made statutory.

4.—My opinion is unchanged that the infant departments of schools should be closed when 10 per cent. of the scholars have been attacked. A period of

three weeks usually suffices, but children returning to school might be required to bring a note from their parents that no one at home has begun to be ill with Measles for a period of one month.

5.—If an infant department is closed it would further be useful if supervision could be exercised over the households from which the children come during the interval. It would also be necessary to see that the children were not allowed to attend other schools in the interval. Further, Sunday Schools attended by the children attacked should also be closed.

6.—The present arrangements are useful, though insufficient to prevent the spread of the disease, and it is not suggested that they should be altered.

7.—The mortality from Measles would be diminished if the poorer children were better fed and cared for generally.

8.—If there is any probability of such powers being granted to a particular Sanitary Authority, application might be made in the next Local Act requiring—

(*a*) That every parent or guardian having a child attending school be required to send immediate intimation in writing to the school on the occurrence of Measles in any person under his charge.

(*b*) That Measles be declared a dangerous disease, with powers applicable to the term *dangerous* similar to those contained in the London Act of 1891.

9.—When Measles or Whooping Cough is prevalent, the older children might be instructed in the precautions to be taken at home in the event of a case occurring.

Medical Officer of Health.

One or two points require further consideration. It may justly be said: "Supposing we succeed, by any means, in preventing children under six years of age from contracting Measles, will not the success of our measures lead to embarassment later on?" The children who have escaped will still be susceptible at higher ages, and we shall have to contend in our higher standards with the trouble which now affects only the infant departments, greatly to the detriment of education.

We are thus led to enquire whether the intensity of the incidence of Measles on the earlier years of life is a matter of selection of particular ages, or is due to the extent to which the disease is liable to overspread those ages.

We know that Scarlet Fever does not readily attack very young children, and that its greatest incidence, though not its highest mortality, falls on the fifth year of life. As the attack rate gradually ascends from birth, it is probable that there is some constitutional factor which determines the result.

From Diphtheria and Membranous Croup, again, the greatest incidence falls on the fourth year of life.

Whooping Cough may affect any age, but attacks with especial readiness and severity the first two years.

Enteric Fever, on the other hand, affects chiefly adolescents and adults.

In the case of Enteric Fever there are, no doubt, two factors at work, greater susceptibility in adult life, and greater exposure.

Smallpox is, on the other hand, an example of a disease, which, diverted by vaccination from infancy, falls more heavily on the later periods of life.

We must conclude that the result of preventing the incidence of Measles and Whooping Cough on children of school age would be a mixed one. The disease would probably fall on later ages with increased incidence, but not with the same intensity of incidence as if it expended itself on the earlier ages.

Now we have seen that to arrest the spread of Measles in the infant department of a school it suffices, generally, to close the department when 10 per cent. of the children have been attacked. But this is not the same thing as saying while 90 per cent. are still susceptible, since in all cases a certain proportion have been already rendered insusceptible by a previous attack. It is only a practical rule, without theoretical significance.

Still, if the department is kept open, the disease goes on to attack a much higher proportion—up to 40 or 50 per cent.—and in all probability there are not a few second attacks, the intensity of infection increasing with accumulation.

It is the same thing with Phthisis in common lodging-houses, in which the crowding of the inmates and the accumulation of tuberculous sputum in the warm day-rooms brings about a terrible mortality.

It appears, then, that the spread of the disease in school depends on two main factors—the proportion of susceptible persons and the intensity of infection. Where there is a high proportion of susceptible persons, the introduction of one case may suffice to cause the infection of a large proportion of the children. Where, on the other hand, a certain proportion of the more susceptible material has been removed, the introduction of two or three cases does not lead to spread.

Now, we cannot, if we would, prevent a certain proportion of the children in infant departments from being attacked, and it is therefore probable, taking into account the diminished susceptibility at higher ages, that effectual control of the disease at younger ages would not be attended by a greatly increased incidence on the higher standards. It must be admitted, however, that this is merely a probability.

Having regard to the high mortality exacted by Measles, I believe that severe cases might often usefully be removed to Hospital, especially from the poorer houses, partly for purposes of prevention, partly to diminish the number of deaths.

Here, again, it is not so easy to speak confidently on the subject of Whooping Cough, as it is not always easy to say when a case is going to be very severe.

I do not suggest, however, making special provision for Measles at the present time, but only that existing provision, when available, should be utilised.

WHOOPING COUGH.

The tables relating to this disease show the death-rate in Manchester for 1903 and for the preceding five years; in 1903 it exceeded the death-rate for England and Wales by 0·11 per 1,000 living.

The rates giving the Whooping Cough mortality for 1903 are as follows:—

1903.—Whooping Cough Mortality.—Rate per 1000 living, compared with mean of five years.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales	0·31	0·30	0·34	0·30	0·29	**0·31**	0·27
*76 Great Towns	0·42	0·38	0·45	0·36	0·37	**0·40**	0·33
London	0·48	0·38	0·43	0·35	0·40	**0·41**	0·35
City of Manchester...	0·31	0·42	0·68	0·41	0·44	**0·45**	0·38
Manchester Township ...	0·41	0·41	0·79	0·41	0·55	**0·51**	0·25
North Manchester	0·14	0·50	0·66	0·48	0·42	**0·44**	0·24
South Manchester.....	0·36	0·37	0·64	0·36	0·39	**0·42**	0·55
*103 Smaller Towns.....	0·27	0·32	0·34	0·30	0·22	**0·29**	0·28
Rural Districts	0·25	0·25	0·27	0·25	0·22	**0·25**	0·22

* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns.

From the above table it will be seen that South Manchester had more than double the mortality rate from Whooping Cough of the other two divisions of the City.

The following are the deaths in quarters, showing that the disease was most prevalent in the first half of the year:—

1903.—Whooping Cough.—Deaths in Quarters in the City, and in Groups and Districts.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	74	88	24	27
Manchester Township ...	12	15	2	4
North Manchester	12	20	5	5
South Manchester	50	53	17	18

The following table shows the districts most affected. It will be seen that the districts most affected were Ardwick, West Gorton, and Openshaw.

1903.—Deaths and Death-rates from Whooping Cough in the various divisions of the City.

Statistical Divisions		Estimated Population	Deaths	Death-rates
City of Manchester		**554,331**	**213**	**0·38**
I.	Manchester Township	132,160	33	0·25
II.	North Manchester	172,289	42	0·24
III.	South Manchester	249,882	138	0·55
I.	Ancoats	44,437	9	0·20
	Central	28,525	11	0·39
	St. George's	59,198	13	0·22
II.	Cheetham	38,778	13	0·34
	Crumpsall	9,051	...	...
	Blackley	9,174	...	...
	Harpurhey	17,809	1	0·06
	Moston	14,241	4	0·28
	Newton Heath	37,143	14	0·38
	Bradford	24,311	5	0·21
	Beswick	11,987	...	...
	Clayton	9,795	5	0·51
III.	Ardwick	42,618	29	0·68
	Openshaw	27,890	20	0·72
	Gorton (West)	30,315	27	0·89
	Rusholme and Kirk.	25,533	3	0·12
	Chorlton-upon-Medlock	57,398	26	0·45
	Hulme	66,128	33	0·50

SUMMER DIARRHŒA AND SIMPLE CHOLERA.

The following tables exhibit the facts in reference to this very fatal disease for a number of years. The mortality in 1902 was the lowest on record, while in 1903 it was considerably below the mean for the previous 15 years. It would be a matter for much congratulation if we could assume that this was due to improvements in administrative methods, but this is not possible. It is true that a strenuous effort has been kept up for a number of years to educate mothers in the feeding of their children. If we are to judge from the facts collected in reference to deaths from Diarrhœa, we should have to conclude that but little result has ensued. The long tube and bottle is in these cases the most common means of artificial feeding noted.

The infectious matter might be conveyed into a house by aerial transmission of infective particles from the stools of previous cases of infectious enteritis or from polluted soil.

On this hypothesis, still, warm, weather should not be so favourable to the transmission of Diarrhœa as warm weather along with a considerable movement of air. The contrary is the fact, yet this possibility cannot be summarily dismissed.

The factors concerned in the production of Summer Diarrhœa are still the subject of much discussion, and there is considerable difference of opinion as to whether the disease is due to contamination of food before reaching the town, or afterwards in the shops and at home. Probably it arises from both sources, and the previous health of the infant is undoubtedly a very powerful element in producing a fatal result.

The usual tables show that the rate of mortality in 1903 per 1,000 living was 0·91 as compared with 1·60, the mean for the previous five years, and that the rate of mortality for the third quarter was 2·19 as compared with 3·59, the mean of the previous 15 years. The highest mortality occurred in the Central District, the next highest in West Gorton and Ancoats.

The following are the registered deaths from Diarrhœa and Simple Cholera in weeks during the third quarter of the year :—

July 11th	6
,, 18th	13
,, 25th	14
Aug. 1st	14
,, 8th	24
,, 15th	29
,, 22nd	39
,, 29th	42
Sept. 5th	31
,, 12th	21
,, 19th	24
,, 26th	20
Oct. 3rd	26
	303

The numbers of deaths in quarters are as follows :—

DIARRHŒA AND SIMPLE CHOLERA DEATHS IN QUARTERS 1893–1903.

	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	Mean for 10 years	1903
First Quarter.....	48	47	51	37	49	55	46	41	45	33	**45**	48
Second Quarter...	131	55	59	78	50	49	53	66	32	33	**61**	49
Third Quarter.....	688	212	574	391	803	807	948	562	865	120	**597**	303
Fourth Quarter...	89	61	220	66	62	179	74	153	74	110	**109**	107
	956	375	904	572	964	1090	1121	822	1016	296	**812**	507

As in 1902, a considerable proportion of the deaths occurred in the fourth quarter of the year.

By means of the following table we are enabled to observe the comparative degree of severity with which different districts of the City have been visited. The figures should be compared with the average figures for the ten years 1894-1903.

1903.—Deaths and Death-rates from Diarrhœa and Simple Cholera in the various Divisions of the City.

Statistical Divisions		Estimated Population	Deaths	Death-rates	Death rates under 1 year per 1000 births.	
					1903	Average 1894-1903
City of Manchester		**554,331**	**507**	**0·91**	**22·14**	**32·46**
I.	Manchester Township.	132,160	186	1·41	31·29	39·80
II.	Northern Districts	172,289	110	0·64	15·01	26·78
III.	Southern Districts	249,882	211	0·84	21·97	31·51
I.	Ancoats	44,437	67	1·51	30·15	40·69
	Central	28,525	48	1·68	48·53	46·67
	St. George's	59,198	71	1·20	25·46	36·03
II.	Cheetham	38,778	17	0·44	10·11	19·17
	Crumpsall	9,051	3	0·33	9·80	19·56
	Blackley	9,174	3	0·33	12·10	9·43
	Harpurhey	17,809	11	0·62	15·87	27·37
	Moston	14,241	3	0·21	8·75	15·35
	Newton Heath	37,143	29	0·78	15·63	26·58
	Bradford	24,311	30	1·23	26·88	41·12
	Beswick	11,987	5	0·42	8·44	29·45
	Clayton	9,795	9	0·92	20·20	43·77
III.	Ardwick	42,618	40	0·94	19·99	30·29
	Openshaw	27,890	26	0·93	27·43	36 17
	West Gorton	30,315	36	1·19	31·11	43·41
	Rusholme and Kirk	25,533	12	0·47	13·99	22·98
	Chorlton-upon-Medlock	57,398	48	0·84	23·88	24·51
	Hulme	66,128	49	0·74	18·68	31·94

By means of the following figures we are enabled to compare the fatality from Diarrhœa and Simple Cholera in Manchester with that prevailing in other parts of the country, and it will be seen that Manchester in 1903 occupies its usual position relative to other towns.

1903.—Diarrhœa and Simple Cholera Mortality.—Rate per 1,000 living, compared with Mean of Five Years.

	1898	1899	1900	1901	1902	Mean	1903
England and Wales	0·96	0·98	0·69	0·91	0·38	**0·78**	0·50
*76 Great Towns.....	1·22	1·21	0·94	1·23	0·54	**1·03**	0·71
London	0·97	0·93	0·78	0·87	0·54	**0·82**	0·64
City of Manchester	2·01	2·05	1·52	1·86	0·54	**1·60**	0·91
Manchester Township	2·66	2·60	2·12	2·72	0·73	**2·17**	1·41
North Manchester	1·66	2·00	1·10	1·61	0·44	**1·36**	0·64
South Manchester	1·85	1·78	1·45	1·56	0·50	**1·43**	0·84
*103 Smaller Towns	1·09	1·22	0·81	1·09	0·35	**0·91**	0·43
Rural Districts	0·75	0·76	0·48	0·65	0·22	**0·57**	0·31

* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns.

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent :—

Third Quarter of the years	Mean Temperature	Rainfall, Inches	Humidity, per cent.	Diarrhœa and Simple Cholera Mortality. Annual Rate per 1,000 living
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77 %	4·17
1896	58°·5	9·7	76 %	2·93
1897	58°·9	9·7	73 %	6·01
1898	60°·1	6·1	74 %	6·00
1899	60°·8	7·7	75 %	6·96
1900	60°·3	9·6	78 %	4·14
1901	61°·9	6·5	74 %	6·33
1902	57°·6	5·9	78 %	0·88
Mean	**59°·0**	**9·4**	**76 %**	**3·59**
1903	57°·8	12·3	77 %	2·19

The third quarter of the year 1902 deserves special consideration, since not only is the death-rate from Diarrhœa the lowest on record, but the rainfall is also the smallest. The average humidity is also not high. The factors which have been considered chiefly operative have been a low rainfall and a high temperature. Now in 1902 the temperature is low, but the rainfall is very small. It may be inferred that the temperature is more important than the smallness of the rainfall. Much, however, depends on the distribution of both.

It is, perhaps, desirable that I should give a somewhat fuller account of the point at which I have arrived in regard to Epidemic Diarrhœa, since on our knowledge of the manner in which the disease is spread depends our power to deal with it.

In the section relating to Measles will be found a statement of the number of deaths year by year from Diarrhœa, and an idea of the relative magnitude of the mortality from this cause will be obtained when it is stated that in one or two years it approximated to that exacted by Phthisis.

From a study of the bacteriology of an acute outbreak of Diarrhœa in and near Victoria Park in 1894, due to the milk from a particular farm, and from the study of an outbreak of meat poisoning at Derby, due apparently to fæcal contamination, taken in conjunction with the study of milks over a period of eight years, Professor Delépine arrived at the conclusion that these are all parts of one phenomenon, and that this is conditioned by the presence in the milk of a bacillus enteritidis identical or allied with Gaertner's.

His observations show that this bacillus multiplies in milk after it has been drawn from the cow, and that the amount of infection in the milk depends on the time during which the milk is kept before consumption, and on the temperature to which it is exposed during transit and keeping. He further draws the conclusion that the epidemic diffusion of Summer Diarrhœa is due mainly to contamination at the farm, though not entirely, and that we must, therefore, direct our chief efforts to obtain a pure supply of milk.

Dr. Newsholme, on the other hand, while accepting Professor Delépine's bacilli as the probable agents of Summer Diarrhœa, does not consider that they are chiefly introduced from without the town.

In support of his contention that the disease is chiefly spread in the town, he points to the high proportion of condensed milks consumed by children dying of Summer Diarrhœa and to the not inconsiderable proportion of breast-fed children who suffer. These two classes, he thinks, consume milk infected chiefly at home.

The point is one of considerable importance in connection with practical administration, and I shall briefly discuss it. There are many other

matters requiring attention. But on this we require to be clear. Other subjects relating to the disease will be discussed elsewhere.

I have first to say that in connection with the outbreak of Diarrhœa in 1894 in Victoria Park, it has always appeared to me that there was some new feature imported into the situation. The outbreak occurred on November 6th and 7th. It was traced quite definitely to a milk supply from a particular farm, and included no fewer than 160 cases. The water which the cows drank, and the water with which the cans were washed, were exposed to the grossest pollution. Yet, up to this point of time, no special incidence of Diarrhœa was noted. So strongly was this view of the case borne in upon me that I pressed the farmer until he came to my office and admitted that on November 8th he had had a cow slaughtered with Mastitis, fearing that it was the cause of the outbreak.

If we are to accept Professor Delépine's bacillus, he may also have concealed the occurrence of Enteritis in man or beast. I am still as strongly of the opinion as I then was, that some new event had occurred.

In connection with the Derby meat poisoning occurrence, evidence of Enteritis in the pig was found.

Is it possible that these special occurrences were the result of a specific Enteritis?

Is it possible that the milks found by Professor Delépine to contain the bacillus enteritidis (Gaertner's?) which was fatal to guinea pigs, came from cows affected with Specific Enteritis, or had been contaminated in the cowshed by excreta derived from such cows?

Cows turned out to grass suffer in May and June from scouring, which, in spite of the slight physiological disturbance, may be specific—at all events, in certain cases. I am informed by Mr. Brittlebank that calves suffer at the same period from White Scour, but that no specific organism causing this fatal condition has been discovered.

There is the objection to regarding either of these Diarrhœas as causal of Summer Diarrhœa that they do not immediately precede the latter.

Yet if the disease is to be regarded as introduced from farms, some antecedent disease in cattle is probable. This subject requires further investigation.

Although bacilli of the class which he believes to be the agents in producing Summer Diarrhœa have been found in the bodies of persons who have died from the disease, it is further needful that Professor Delépine should receive assistance in obtaining material from the bodies of infants who have died from Summer Diarrhœa.

But all this does not help us to settle the question whether this disease derives from the cowshed or from the home.

The history of the outbreak of ice-cream poisoning in Salford in July, 1900, clearly shows that a few hours may suffice to produce a growth sufficient to produce acute Diarrhœa under favourable circumstances.

For further light we turn to the manner in which fatal cases occur week by week. Almost any year will suffice.

Take the year 1900, since we have for this year a full investigation of the relations of temperature and rainfall.

The deaths are week by week.

Week ending—

July 7	July 14	July 21	July 28	Aug. 4	Aug. 11	Aug. 18	Aug. 25	Sept. 1	Sept. 8	Sept. 15	Sept. 22	Sept. 29
6	7	11	11	37	63	50	50	83	78	64	36	58

This year does not show so typically as most years the gradual culmination and decline of the diarrhœal mortality.

Yet the atmospheric temperature reached its maximum on July 11th, and if the disease was diffused by milks we should expect a considerable increase following on this temperature, which would, on the hypothesis of a contamination at the farm, have then exerted a maximal influence.

The picture presented is rather one of the gradual multiplication of points of infection, which agrees rather with the hypothesis of greater infection in the town than at the farm, unless it should appear that Specific Enteritis is prevalent in cattle in the Diarrhœa season, of which there is no evidence as yet.

In fact it is the course of a rapidly spreading infectious disease, like Measles and Influenza.

We know, however, that the disease does not extend easily or readily inside the household, or from one person to another, and the mode of transference must be different.

There can be no doubt that food is the medium of transference.

In my earlier Annual Reports I have advanced the view that the infection multiplies in polluted soil.

Such multiplication might occur, it is true, on the farm.

Now I have shown in my Annual Reports that it is temperature rather than rainfall which is the determining factor of a high diarrhœal death-rate.

In certain cases, in fact, rainfall probably rather favours increase of Diarrhœa, and what effect it produces in the diminution of Diarrhœa is due to the lowering of atmospheric temperature which it causes.

A study of the daily curves of temperature and of Diarrhœa deaths given in the Annual Report for 1900, arranged according to the dates of attack, shows that atmospheric temperature reacts in a day or two on the incidence of Diarrhœa.

Now if the increase of Diarrhœa were due to the multiplication of specific organisms in imported milk, assuming that there is a sufficient number of the infecting organisms to inoculate the milk, we should expect the most rapid diffusion of Diarrhœa to occur at that season when the atmospheric temperature is highest. This is usually in the month of July, and the chart given in the Annual Report for 1900 shows that neither the highest death-rate nor the greatest increase of cases coincides with or closely follows the maximum atmospheric temperature. Only on one condition could we accept the imported milks as the chief factors in the spread of Diarrhœa, viz., that the specific germ multiplies so much at the farm as the consequence of the warm weather that the amount of infection introduced into the milk later on more than counterbalances the effect in July of a higher temperature on the milk, which has then presumably received a smaller dose of infection. This does not seem a likely hypothesis.

We must, therefore, with our present knowledge fall back on the immediate surroundings of the patients for the origin of their attacks.

How, then, does the disease come to be diffused rapidly every season?

We may assume that the infective matter is swallowed. Were the disease transmitted to any great extent by the respiratory tract, it would be far more infectious from individual to individual than it actually is.

We must, therefore, believe that infection is conveyed from one house to the food in another by some means.

Now it has been very confidently asserted that house flies are the means of transmission. So far, not a shadow of evidence has been adduced, unless it be the absence of other ascertainable means of transport. Yet the proposition is not one that we can positively reject. Warm weather brings flies, and warm weather brings Diarrhœa about the same time. It is certain that flies can and do carry infective matters, and the large numbers of flies which settle on food in poor households might, therefore, quite well act as carriers. In cold summers, when there is very little Diarrhœa, there are few or no flies.

These may be mere coincidences—but they may not, and for the prevention of Diarrhœa it is most important to settle the question. In 1902 I

arranged with Dr. Beatty to make observations on the number of flies caught in fly-traps day by day, and a record was—I am told—kept, which has been, unfortunately, misplaced. Last year, however, Dr. Forbes had observations made at Monsall and Clayton Hospitals, the results of which are recorded in his statement on Enteric Fever.

The observations were, apparently, begun somewhat late, but they do admit of some reasoning.

It is quite certain from them that house flies have attained considerable numbers before the Diarrhœa season has set in, so that the possibility of transmission by flies must be admitted.

The first marked increase in Diarrhœa occurred in the week ending July 11th. Unfortunately, we cannot compare the number of flies caught in this week with that caught in the previous week.

The next marked increase in deaths occurred in the week ending August 8th, and I will assume that the increase of cases occurred in the week ending August 1st. Here we have also a marked increase in the number of flies. The next marked increase in the number of deaths occurred in the week ending August 22nd, and of cases, therefore, in the week ending August 15th. In this week also we have a marked increase in the number of flies. The maximum week of flies coincides with the maximum number of deaths.

After this the number of flies caught does not correspond with the number of deaths in the week following.

It must be allowed, however, that by this time infection would be so wide. spread that we could not expect Diarrhœa to decrease so rapidly as flies.

So far, then, as these observations go, they are in accord with the hypothesis of transmission by flies, although the observations need to be greatly extended, and to arrive at exact conclusions other methods of inquiry are needed.

Are there any other means by which Diarrhœa can be introduced into new households?

There is conceivable :—

> The transmission by fruit, meat, etc., which has been handled by dirty people. If this is to infect the children's milk it must be indirectly through dirty hands. This is too oblique, and may, probably, be rejected.

One other line of investigation has not been used in this inquiry. We may ascertain what has been the infantile mortality from Summer Diarrhœa for the last ten years in the different sanitary districts of Manchester. It may be that the distribution of this death-rate will throw some light on the difficulties.

The figures are as follows, giving, for the present, only the average death-rate for the ten years :—

City	Township	Northern	Southern	Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey
32·46	39·80	26·78	31·51	40·69	46·67	36·03	19·17	19·56	9·43	27·37

Moston	Newton Heath	Bradford	Beswick	Clayton	Ardwick	Openshaw	West Gorton	Rusholme and Kirks.	Chorlton-on-Medlock	Hulme
15·35	26·58	41·12	29·45	43·77	30·29	36·17	43·41	22·98	24·51	31·94

It will be seen that the Diarrhœa death-rate is highest over a broad belt passing through the centre of the City, and dividing North from South. This includes Openshaw, Clayton, West Gorton, Bradford, Beswick, Ardwick, Ancoats, Central, and St. George's.

Two other districts have also a high mortality, viz., Hulme and Harpurhey. Now, with regard to the three Central districts—Ancoats, Central, and St. George's—the social factors are probably the most important; while in Bradford, Beswick, and Harpurhey, the number of houses built on made ground may have an effect. In West Gorton and Bradford we have also to deal with social factors and middens. In Hulme the confined, dirty, and smelling passages have no doubt contributed. On the whole, the separation of districts according to Diarrhœal death-rates marks also a social separation, and also a separation in regard to cleanliness.

But I reserve the complete table for further consideration.

The subject requires further investigation and study. These propositions may be laid down meanwhile :—

1. The previous condition of infants as regards nutrition is a powerful factor in determining the death-rate from Summer Diarrhœa. We require, therefore, increasing attention directed to the instruction of mothers and girls in this subject.

2. It is probable that districts in which houses have been built on "made" ground are specially affected. If so, this may be a question of flies.

3. The chief determining factors in the seasonal variations of Diarrhœa in the same areas, and among persons of the same class, are temperatures of the air and of the soil, the one being a function of the other, but not necessarily acting in the same manner.

4. Flies may be the chief agency by which the disease is transmitted. Hence, in the Diarrhœa season, all food should be protected from flies, especially milk, sugar, syrup, soups, meat, etc.; in fact, all sweet or moist foods.

5. Cleanliness, personal and otherwise, is clearly of great importance. Infants should have clean clothing, and not be allowed to rest on the floor.

6. If any person is suffering from Diarrhœa, the excreta should be disinfected.

7. Water-closets are required in place of middens and pails.

8. Mothers with infants require special instruction in the Diarrhœa season, and an effort should be made to supply such instruction.

9. In warm weather the streets and passages should be watered with a view to cleanliness, and also to cooling of the air.

10. Special care must always be bestowed on milk and feeding utensils.

All milk should be kept covered over, and protected from flies and dust.

When it arrives at the house, milk should be at once well boiled and poured into a clean jug, which should then be covered with a clean cloth, and placed in a large vessel of cold water to cool. When partially cooled it should be again placed in quite cold water, and kept there.

The long tube should never be used with a feeding bottle, and all utensils used must be kept scrupulously clean.

It is not, as yet, possible to simplify these precautions.

This subject will be more fully dealt with elsewhere.

VOLUNTARY NOTIFICATION OF PHTHISIS.

To the Medical Officer of Health.

I beg to submit a report on the Voluntary Notification of Phthisis during the year 1903.

During the year 1903 the total number of new cases of Phthisis notified to the Medical Officer of Health was 1,357. Of these, only 251 were notified by private practitioners, this being the lowest number of private cases reported in any one year since the adoption of the voluntary notification of Phthisis in 1899.

The following table shows the number of cases notified by the Poor-law Medical Officers, from other Institutions, and by private practitioners :—

Year	Poor-law cases	Institutions	Private practitioners	Total
1900	587	446	540	1573
1901	625	373	341	1339
1902	667	305	303	1275
1903	556	550	251	1357

There has been a steady decrease in the number of cases notified by private medical practitioners, while the poor-law cases steadily increased in number until 1902, but showed a decided drop in 1903, when the number of cases was less by over a hundred than in the preceding year. The cases notified from institutions gradually decreased in number until 1902, but in 1903 there was a total of 550 cases notified, being an increase of 245 on the previous year, and being by far the largest number of notifications received from institutions in any one year. This large increase was chiefly due to the greater number of certificates received from the Consumption Hospital.

PARTICULARS OF CASES NOTIFIED FROM INSTITUTIONS.

Institutions	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Manchester Union Workhouse	41	103	79	113	336
Chorlton Union Workhouse	44	54	41	40	179
Prestwich Union Workhouse.....	2	2	2	3	9
Poor-law Union Cases	10	8	6	8	32
Consumption Hospital	121	67	101	73	362
Ancoats Hospital	16	7	9	10	42
Chorlton-upon-Medlock Dispensary ...	...	4	...	7	11
Hulme Dispensary	6	5	6	4	21
Gartside Street Dispensary	10	7	9	8	34
Royal Infirmary	4	8	7	13	32
Medical Mission, Red Bank	3	4	5	4	16
Clinical Hospital	1	...	...	...	1
St. Mary's Hospital	...	...	...	...	...
Southern Hospital	...	...	...	...	...
Children's Hospital, Pendlebury	...	...	...	...	...
H.M. Prison	...	...	7	24	31
Total	258	269	272	307	1106
Private Practitioners	65	62	73	51	251

The following table shows the cases notified in the various districts during the year 1903 and also the number of deaths from Phthisis in the same districts :—

	CASES NOTIFIED					DEATHS				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
City of Manchester	**323**	**331**	**345**	**358**	**1357**	**252**	**268**	**252**	**251**	**1023**
I. Manchester Township	97	144	146	185	572	88	100	108	100	396
II. North Manchester	61	60	57	51	229	47	51	38	45	181
III. South Manchester	165	127	142	122	556	117	117	106	106	446
I. Ancoats	35	48	41	57	181	22	29	28	29	108
I. Central	18	36	33	41	128	24	24	26	31	105
I. St. George's	44	60	72	87	263	42	47	54	40	183
II. Cheetham	15	12	18	15	60	11	9	4	7	31
II. Crumpsall	1	1	1	...	3	4	1	1	3	9
II. Blackley	...	2	4	5	11	1	2	3	3	9
II. Harpurhey	15	6	7	5	33	10	7	3	6	26
II. Moston	2	2	2	2	8	...	3	2	4	9
II. Newton	11	15	10	7	43	9	13	13	12	47
II. Bradford	12	15	8	9	44	11	6	8	5	30
II. Beswick	2	5	4	1	12	1	8	3	1	13
II. Clayton	3	2	3	7	15	...	2	1	4	7
III. Ardwick	26	24	20	15	85	21	13	20	15	69
III. Openshaw	13	8	9	8	38	9	8	11	9	37
III. West Gorton	18	15	14	12	59	13	16	8	11	48
III. Rusholme and Kirkmanshulme	7	7	7	6	27	5	11	7	5	28
III. Chorlton-upon-Medlock	33	37	42	36	148	25	23	26	25	99
III. Hulme	68	36	50	45	199	44	46	34	41	165

It is satisfactory to note that in almost every district the proportion of cases notified to deaths registered is considerable. It is highest, no doubt, in the poorest districts; but it is precisely in these that instruction and administrative help are most required, though here investigation of the cases is most difficult and least satisfactory. A careful examination of the table would seem to indicate that the work done under voluntary notification is of the suitable quality and amount. What extension is needed will probably accrue when hospital provision is made for the more urgent cases.

Of the cases notified, 206 were inmates of common lodging-houses. This is an unduly large proportion (3·4 per cent.), as the total number of inmates of common lodging-houses is estimated by the police inspector at 6,022, and serves to show the prevalence of the disease in such houses. Notices *re* spitting have been suspended in all the common lodging-houses in the City for some years. These houses have also been frequently disinfected in connection with the notification of Consumption cases, and more especially if signs of spitting were found to be extensive. By this means a considerable improvement has been effected in these houses during the last few years.

During the year, 1,159 cases were reported as having been removed to, and nursed in, hospitals.

The total number of deaths from Phthisis during the year was 1,023; of these, 578 were notified cases and 445 had not been notified.

In the following table the number of deaths from Phthisis and the annual rates per 1,000 for Tabes Mesenterica, Phthisis, and other Tubercular Diseases are given :—

Year	No. of Deaths from Phthisis	Annual Rates per 1,000		
		Tabes Mesenterica	Other Tubercular Diseases	Phthisis
1900	1135	0·17	0·60	2·09
1901	1144	0·20	0·83	2·09
1902	1145	0·16	0 55	2·08
1903	1025	0·18	0·58	1·85

The average length of illness of a Consumptive (based upon 500 investigated cases in which death has occurred—doubtful cases being discarded) was found to be 2·8 years. If the incubation period be taken as 12 months, we find that the average interval between the reception of infection and death is nearly four years. Owing to this chronic course of the disease, evidence of good results from the voluntary notification of Phthisis, as shown by the

number of deaths or the annual death-rate from Phthisis per 1000, could not be expected before 1903, and scarcely even then, as it was in September, 1899, that the first case was notified. It is encouraging to find that the number of deaths was fewer than in any of the four previous years, and that the rate of 1·85 per 1000 living is the lowest on record for the City. Against this, however, must be set the fact that the number of deaths ascribed to other Tubercular Diseases shows a slight increase on 1902. In addition, the year 1903 shows a diminished death-rate all round, especially in Respiratory Diseases, so that although no conclusive deductions as to the efficacy of notification in reducing the number of cases can yet be made, it is reasonable to conclude that the marked reduction in the phthisical death-rate may have been due in some measure to the precautions taken in connection with the notification of cases of consumption. Personal instructions in the precautions required to prevent the spread of infection are always given by the Visiting Medical Officers, and, in addition, a handbill of instructions is given to each patient. As the average length of illness before being visited is 2 years 4 months, and the average duration after being visited is only 6½ months, these visits are of more value as a general educative agent than in preventing the spread of infection from individual cases, although even as regards the latter they must be of considerable use, as the patients would undoubtedly be most dangerous during the latter part of their illness, when too feeble to take proper precautions personally.

The effect of the popular instruction which has been going on in Manchester in recent years is evidenced by the fact that it is now only on the rarest of occasions that patients are found by the Medical Officers not taking some precaution in the disposal of their sputum. They practically all know that certain precautions should be carried out, but occasionally, although they admit the knowledge, they are found to be too careless to systematically carry out the requisite preventive measures.

The facilities for the examination of sputum were more taken advantage of than in any previous year, as 628 specimens were submitted for examination. Of these, 239 showed the presence of the tubercle bacillus, and 389 gave a negative result.

Supervision of Cases.

The notified cases are visited monthly by the Female Health Visitors in the Central districts of the City and by the Sanitary Inspectors in the outlying districts. In some cases where the houses are kept very clean (where special precautions are taken), and when monthly visiting is objected to, the visits are paid quarterly. At these periodical visits, records are made as to whether the patients carry out the instructions given by the Medical Officers, as to how the expectorations are dealt with both inside and

outside the house, and as to whether the house is free from dust. For this purpose the following form is used :—

CASE OF CONSUMPTION.

1. Does the patient carry out the personal instructions given by the Medical Officers as regards receiving the sputum in a spit cup or spit bottle, or receiving it in a rag or piece of paper, and immediately burning it?	
2. How is the expectoration dealt with inside?	
3. How is it dealt with outside? ...	
4. Is the house kept **rigorously clean and free from dust by wet cleansing?**	

Signed _____

Health Visitor.

Date _____

During the year 333 fresh cases were added to the Health Visitors lists, and the total number remaining on the lists in December, 1903, was 353.

There were 469 cases added to the Sanitary Inspector's lists during the year, and the number remaining at the end of the year was 396.

Cleansing and Disinfection.

There were 3,245 cleansings carried out in 2,813 houses during the year. Of these, 1,127 cleansings in 1,054 houses were done by the Corporation (484 by chlorinated lime solution and 643 by Esmarch's method). The tenants or owners carried out 2,118 cleansings in 1,759 houses.

In connection with this work, 1,990 cases were entered in the business book.

A summary of these facts for the different years since the commencement of notification is given in the following table side by side for comparison :—

	1903	1902	1901	1900	1899 Sept. 1 to Dec. 31	Totals
Cases Visited and Registered—						
Males	848	917	959	789	231	3744
Females	515	532	546	535	194	2326
Totals	1363	1449	1505	1328	425	6070
Houses Disinfected—						
1. By Corporation—						
(*a*) With solution of chlorinated lime only	484	601	792	581	No Record	2458
(*b*) With lime solution only	0	2	15	109		126
(*c*) By Esmarch's method and solution of chlorinated lime	643	359	144	0		1146
Totals	1127	962	951	690	...	3730
2. By Tenants—						
Esmarch's method.....	2118	1937	1776	1299	No Record	7130
Totals	3245	2899	2727	1989	...	10860
Specimens of Sputum Examined						
Positive.....	239	248	232	104	...	823
Negative	389	337	285	154	...	1165
Totals	628	585	517	258	...	1988
Deaths—						
(*a*) Among total cases visited and registered	578	652	638	560	93	2521
(*b*) Among all cases for Manchester (including those under *a*)	1023	1145	1142	1133	270	4712
Cases reported as sent to Hospital	1159	1166	1012	851	140	4328
Notified from common lodging-houses	206	239	254	146	41	886

Deaths amongst notified cases.

It is not possible to keep under observation all the cases notified until death occurs, or until a cure has been effected. Many cases leave the City, others by frequent changes of address are ultimately lost sight of, whilst in the majority of the common lodging-house cases supervision is not practicable.

At the end of 1903, however, over 40 per cent. of all the cases notified were known to have died, as shown in the following table :—

At the end of 1899, 21·88 of notified cases (for 4 months) had died.
„ „ 1900, 37·25 „ „ (for $1\frac{4}{12}$ years) „
„ „ 1901, 39·62 „ „ (for $2\frac{4}{12}$ „) „
„ „ 1902, 41·27 „ „ (for $3\frac{4}{12}$ „) „
„ „ 1903, 41·53 „ „ (for $4\frac{4}{12}$ „) „

The same facts expressed in a different manner are given below :—

At the end of 1899, 21·88 of the notified cases (for 4 months) had died.
During 1900, 33·72 of the remainder (for $1\frac{4}{12}$ years) had died.
„ 1901, 24·49 „ „ (for $2\frac{4}{12}$ „) „
„ 1902, 19·08 „ „ (for $3\frac{4}{12}$ „) „
„ 1903, 14·00 „ „ (for $4\frac{4}{12}$ „) „

HISTORY OF INFECTION.

In the following tables the sources of infection of the cases investigated are given. It is much easier to find a probable source of infection in those cases notified by private practitioners, or from institutions other than workhouses, than in workhouse cases A frequent history in the workhouse cases is that the patient was intemperate, and had lived in common lodging-houses for several years; he rarely knows of any intimate companion having consumption, but usually states that he has frequently lived in common lodging-houses with men having bad coughs.

It will be observed that the most commonly given sources of infection are near relatives, workfellows, and companions—that is, those with whom a patient comes most closely in contact; while those holding a more remote relationship, although, of course, more numerous, are not in such intimate contact with him, and hence are not such frequent sources of infection.

This is relatively much less evident in the table of workhouse cases than in the other, the explanation being partly that so many of the workhouse cases live in common lodging-houses, and therefore away from their relations, and partly by the fact that such cases usually prove less intelligent informants.

Amongst near relations it will be seen that son and daughter appear as the source of infection in very few instances. The explanation of this, in all probability, is that as Consumption is most prevalent between the ages of 25 and 40, the parents would in many cases be dead, and in the majority of other instances would not live in the same house.

The number of soldiers apparently infected in South Africa was 14. This seems a very large number, and shows that, in spite of the open-air life enjoyed there, the hardships encountered, or other causes, rendered them very susceptible to infection.

CASES OTHER THAN THOSE NOTIFIED FROM THE WORKHOUSE.

SOURCE OF INFECTION	Likely Source	Less Likely	Possible
Father	34	24	5
Mother	20	12	9
Son	4	...	...
Daughter	4	...	...
Brother	22	11	2
Sister	22	14	3
Husband	5	5	1
Wife	7	3	...
Uncle...	3	3	2
Aunt	2	...	...
Cousin	6	1	...
Grandfather	...	2	1
Grandmother	...	...	1
Step-father	1	...	...
Step-mother	1	1	...
Parents	1	1	...
Mother-in-law	3	...	1
Brother-in-law	8	3	1
Sister-in-law	4	2	...
Niece's Husband	...	...	1
Step-brother	1	...	...
Housekeeper	1	...	...
Servant	2	...	...
Mistress	...	1	...
Employer	1	1	...
Landlady or Landlady's Husband	5	1	...
Lodger	4	4	3
Fellow-lodger	1	...	...
Neighbour	9	6	13
Companion	21	10	1
Workfellow	32	45	14
Workplace	1	4	3
Work	9	7	7
Houses (including public-houses)	11	17	9
Daughter of Tenant	1	...	...
Landlady's Child	2	...	...
Nursing a Consumptive	1	1	...
Being nursed by a Consumptive	1	...	...
Milk	...	...	6
Others	2	2	1
Soldiers infected in South Africa	4	1	...
Fiance or Fiancee	1	...	...
Total	257	182	84

The total number of cases other than workhouse cases was 801; no information was available in 21 of these. Multiple sources of infection were noted in 53 instances.

Cases notified from the Workhouses.

Source of Infection	Likely Source	Less Likely	Possible
Father	10	5	4
Mother	14	10	2
Son	...	1	...
Daughter	1	1	...
Brother	20	6	2
Sister	11	5	1
Husband	8	6	...
Wife	14	7	1
Uncle	1	1	...
Niece	4	1	...
Nephew	1	...	...
Father-in-law	...	1	...
Mother-in-law	1	...	...
Brother-in-law	...	1	...
Sister-in-law	1	...	...
Step-father	1	...	...
Son-in-law	1	...	...
Lodger	...	2	...
Fellow-lodger	5	4	1
Neighbour	5	4	4
Companion	15	8	3
Workfellow	16	22	8
Houses (including public-houses)	75	72	9
Workplace	3	5	1
Work	19	8	5
Employer	...	2	...
Servant	...	1	...
Landlady or Landlady's Husband	4	...	...
Landlady's Child	1	...	...
Soldiers infected in South Africa	8	1	...
Nursing a Consumptive	1	...	...
Others	...	1	...
Total	240	175	41

The total number of workhouse cases was 456. There was no available information in 35, while double sources of infection were noted in 36.

The workhouse cases were more fully investigated during 1903 than in any previous year, as all cases reported as being in the workhouse hospital were visited there, and the required information was obtained from the patient personally. Formerly, in all common lodging-house cases, and in the majority of patients living in houses let in lodgings, no information, or very meagre information, was procured.

It will be observed that a larger proportion of the workhouse cases are classified under likely sources of infection than of cases notified from other institutions and by private practitioners, but this is entirely due to the greater number apparently infected in lodging-houses and public-houses. If the latter be excluded, a likely source of infection was more frequently found in cases other than workhouse cases.

Card Index.

The Card index of the houses where Consumptive patients have lived has been found of much value, and has been extensively used during the year as a ready means of discovering the particulars of any required case of Consumption when the address is known. This index now contains 10,500 cards, with from one to five cases on each.

Occupation.

The principal occupations followed by the cases investigated are given below. If the number given under the various occupations be compared with the table given in the report for last year, a general correspondence in numbers will be found.

PHTHISIS—1903.

PRINCIPAL OCCUPATIONS—FEMALES.

Occupation	General	Crumpsall	Withington	Total
Cotton Manufacture	15	11	2	28
Charwomen	19	21	11	51
Do. at Public-houses	1	0	0	1
Domestic Servants	6	6	5	17
Housework	79	14	19	112
Laundresses	3	2	5	10
Machinists	30	6	7	43
Waitresses at Public-houses	3	0	2	5
Rubber Workers	7	0	1	8
Hawkers	0	9	0	9
Milliners and Dressmakers	6	1	1	8
Total	169	70	53	292

PHTHISIS—1903.

Principal Occupations—Males.

Occupation	General	Crumpsall	Withington	Total
Barmen	6	2	3	11
Building Trade	8	7	8	23
Commercial Travellers	4	0	1	5
Cotton Manufacture	3	3	0	6
Clerks	20	0	1	21
Coach Drivers and Cleaners	1	1	5	7
Dock Labourers	1	6	5	12
Dyeing	2	4	4	10
Gaswork Employees	1	2	1	4
Glass Works	1	1	0	2
General Labourers	16	24	13	53
Hawkers	3	25	8	36
Ironworkers	43	12	12	67
Market Porters	3	19	0	22
Printers	4	2	3	9
Rubber Workers	10	1	4	15
Railway Employees	10	1	3	14
Soldiers	12	4	5	21
Shoemakers	7	11	3	21
Tailors	13	3	4	20
Warehousemen (not including Porters)	17	11	9	37
Warehouse Porters	2	5	4	11
Woodworkers	21	11	5	37
Pork Butchers	4	0	0	4
Total	212	155	101	468

The following post-card has been sent to a large number of factories and workshops during the year :—

Town Hall, Manchester,

_____ 190

Dear Sir,—Will you kindly inform me whether you are willing to put up cards in reference to spitting in your workrooms (one in each room, also in the closets)? If yes, please say how many you require.

Yours faithfully,

Medical Officer of Health.

A reply post-card was attached.

It speaks well of the intelligent interest which is now being taken in Manchester by the owners of large places of business that 159 replies were received in the affirmative, with a request for 1,542 notices in reference to spitting.

CONSUMPTION AND SCHOOLS.

It is well known that infectious diseases such as Scarlet Fever and Measles are frequently contracted at school The records of the Tuberculosis Department have been examined in order to ascertain what effect, if any, schools have in the dissemination of Consumption amongst children.

Of the 6,070 cases notified and investigated since the adoption of the voluntary notification of Phthisis in September, 1899, there were 373 children found who might have contracted the disease at school, that is, were of school age at the time of the infection. But in 111 of these cases there was no school given, partly because a large number of them had never been to school owing to natural debility or disease, and partly because in some cases the name of the school attended was not stated. This leaves 262 cases where the child was attending a school at the period of infection. In classifying the cases it was noted whether there was a likely source of infection other than the school, and in these the school was not considered responsible, but in all other cases it has been taken that the infection may have been contracted at school. In the following table the average attendance of the affected schools in January, 1902, is given, as this is approximately the middle of the period being considered.

Denomination	Number of Schools implicated	Average attendance January, 1902	Number of cases that may have been infected here	Percentage of these to average attendance	Number of cases that have been infected elsewhere	Total number of cases	Percentage of total to average attendance
Board Schools.....	46	32,971	40	0·12	71	111	0·34
Church of England...	26	14,873	25	0·17	35	60	0·40
Roman Catholic	18	11,771	34	0·28	45	79	0·67
Wesleyan.....	3	1,313	2	0·15	3	5	0·38
Jews.....	1	1,926	4	0·20	3	7	0·36
Totals.....	94	62,854	105	0·17	157	262	0·41

The percentage of cases possibly infected in schools is a very small one. It is highest in the Roman Catholic Schools, and lowest in the Board Schools.

There are 46 Board Schools implicated, having an average attendance of 32,971. Amongst these there were only 40 children possibly infected at school in a period of nearly four and a half years. In addition, the 71 cases with a probable source of infection other than the school would continue to attend the school, and would also be availing sources of infection. Three Board Schools had 3 cases each possibly infected at school. In no school were there more than 3. Two schools had 4 cases each infected outside the school. These schools are given in the table below, the cases being denoted by the date of notification :—

School	Cases with history of infection	Cases with no history of infection	Average attendance
School in Ardwick	1900, 1900	1899, 1902, 1902	1130
School in Bradford	1902, 1903, 1903 ..	1899, 1903, 1903	896
School in Ardwick	1900, 1902	1900, 1901, 1903	1100
School in Hulme.....	1899, 1902, 1903, 1903	1901, 1901	740
School in Beswick	1901, 1901, 1902, 1903	1901	1923

These are the schools having the largest number of notified cases attending them. It will be observed that in nearly all of them there is a sequence of cases year by year.

The Wesleyan and Jewish Schools are so few that they may be disregarded. The next in order, then, are the Church of England Schools. At these, 25 children may have been infected at school, as no other evident source could be ascertained. The average attendance at the schools in question was 14,873 in January, 1902. The proportion is thus a very small one.

One school had four cases possibly infected at school, this school having other four cases attending it. Three schools had each three cases which may have been infected at school.

The following table gives the dates of notification of the cases at these four schools :—

School	Cases with History of Infection	Cases with no History of Infection	Average Attendance
School in Hulme.....	1899, 1899, 1902, 1903	1899, 1899, 1899	866
School in St. George's...	1899, 1901, 1903, 1903	1900, 1901, 1903	915
School in Hulme.....	1900, 1902, 1902, 1902	1900, 1901, 1901, 1903	860
School in Central.....	1899, 1899	1899, 1899, 1901	529

The Roman Catholic Schools show a decidedly worse record, but the children attending these schools are drawn from a class where cases of Consumption are more common, and are more likely to be notified. Here there were 34 cases, apparently infected in 18 schools, amongst a daily average attendance of 11,771. The dates of the notification of the cases in the schools most severely affected are given below :—

School	Cases with History of Infection	Cases with no History of Infection	Average Attendance
School in St. George's...	1899, 1902, 1903, 1903	1899, 1900, 1900, 1901, 1902, 1902	1880
School in Hulme.....	1899 (three cases) 1900 (two cases) 1901 (two cases) 1902 (one case) 1903 (four cases)	.....	1030
School in Newton	1902, 1903	1899, 1899, 1899, 1900	965
School in Miles Platting	1899, 1900, 1903...	1901, 1902.....	653
School in Bradford	1902, 1903, 1903...	1900, 1901, 1903(?), 1903	763
School in Ancoats	1900, 1903	1902, 1903, 1903	1152

The percentage of cases infected in any of these schools is a very small one, but as children are but rarely affected with Pulmonary Consumption, and

very frequently with other forms of Tuberculosis, these figures cannot be taken as representing the amount of Tuberculous infection received at school. According to the tables in the Supplement to the Fifty-fifth Annual Report of the Registrar-General, teachers do not suffer greatly from Consumption, as the comparative mortality figure for Phthisis in all occupied males is 185, and in schoolmasters is 111.

It is not possible to obtain the amount of other forms of Tuberculosis contracted at school.

The influence of schools in the spread of Pulmonary Tuberculosis, although present to a limited degree, is thus not of much importance numerically, and is likely to decrease as the construction of schools improves, as is shown by the comparatively low rate in the more modern Board Schools.

Personal Habits.

The personal habits of the patients with special reference to intemperance have been got out in age-groups, the sign + standing for good personal habits, and the sign — for bad. In order to make comparison easy the figures for 1902 and 1903 are given in the table below :—

PERSONAL HABITS.—MALES.

Year	0-14		15-24		25-44		45-64		65 and upwards.	
	+	—	+	—	+	—	+	—	+	—
1902 ...	16	1	73	17	138	189	58	171	4	19
1903 ...	45	2	105	14	162	182	77	108	2	11

PERSONAL HABITS.—FEMALES.

Year	0-14		15-24		25-44		45-64		65 and upwards.	
	+	—	+	—	+	—	+	—	+	—
1902 ...	18	0	97	1	157	59	43	27	5	1
1903 ...	61	0	120	6	167	40	46	18	2	0

The sign + stands for good personal habits, and the sign — for bad.

The general resemblance as regards the relative proportions of the numbers having good and bad personal habits at the various age-groups is very close and again bears out the fact that in females and in young males it is difficult to obtain evidence of intemperance.

Predisposing Illnesses.

An important section of the investigation form is No. 22, which reads :— "Has patient sustained any injury or suffered from any weakening disease before contracting Consumption." An effort has been made to classify the mass of important information contained in the answers to this question, and to make the information complete the classification has not been confined to one year, but has been extended to include all the cases investigated, to the number of 6070 (males 3744, females 2326).

In the following table the chief diseases are given, the acute in two sections—(1) within 5 years of the onset (2) from 5–10 years before onset of Phthisis; while the more chronic diseases, which would extend over a prolonged period, could not be thus classified :—

Disease (Acute)	Within 5 years	Within 5-10 years	Disease (Chronic)	Numbers affected
Pleurisy	91	20	Chronic Bronchitis or Chronic Cough	213
Pneumonia (lobar)	142	38	Asthma	4
Pneumonia (Catarrhal)	9	1	Scrofulous Glands	48
Pneumonia and Pleurisy	13	2	Tuberculous Joint disease	23
Acute Bronchitis	11	3	Phthisis (previous attacks)	2
Enteric Fever	30	7	Caries	26
Influenza	143	13	Chronic Throat Affections	14
Measles	41	7	Diabetes	6
Whooping Cough	22	2	Chronic Rheumatism	19
Scarlet Fever	19	5	Consumption of Bowels	7
Diphtheria	7	2	Lupus	3
Smallpox	4	3	Bright's Disease	5
Rheumatic Fever	38	11	Tuberculous Epididymitis	3
Gastro-Enteritis	10	...	Epilepsy	14
Gastric Ulcer	11	2	Infantile Paralysis	5
Diarrhœa	12	...	Ischio-rectal Abscess	6
Dyspepsia	6	1	Fistula in Ano	14
Acute Nephritis	3	1	Anæmia	8
Erysipelas	8	1		
Beer Poisoning (Arsenical)	11	...		
Lead Poisoning	2	3		
Injuries, operations for non-tuberculous diseases	153	28		
Confinement	66	...		

Of the acute diseases, Pneumonia and Influenza are by far the most numerous. The number under Influenza is no doubt too large, as the initial illness in the development of Phthisis is frequently mistaken for Influenza. Hence, Pneumonia seems to be the chief illness predisposing to the onset of Phthisis, and as far as these figures go is of far more importance than Pleurisy, which is known to be frequently one of the first signs of Consumption. Of the specific infectious diseases, Enteric Fever and Measles are the most important, and, having regard to the relative prevalence of the two diseases, Enteric Fever is by far the more influential of the two.

A large number of cases had a history of an injury or operation (for non-tuberculous complaints).

Another important matter is the relationship of pregnancy and child-bearing to the development of Consumption. There are 66 instances on record where the pregnancy was followed very shortly by the symptoms of Consumption, and to which the patient usually dated her illness. As the females numbered 2,326 the proportion of such cases is very high—greater even than that of Pneumonia. As the child-bearing period of life may be said to extend from 20 to 45 years, and as the above number includes all females, the importance of the above figures is greatly increased. It would seem that females in the puerperium are comparatively easily infected. It may be, also, that stationary foci of tuberculosis are stimulated into activity by the strain of child-bearing.

Of the chronic diseases, Bronchitis and the various forms of chronic tuberculous affections are the most important. No doubt there is considerable error in the number entered under Chronic Bronchitis, as it is very common for patients during the initial part of their illness, and frequently also during the later stages, to consider their illness as Bronchitis.

JAMES M. COWIE, M.D.

TUBERCULOSIS AND MILK

I have much pleasure in submitting my report on the work done during the year 1903.

The duties I was appointed to carry out were—(1) Inspection of the Manchester Cowsheds and Dairies as to their compliance with the Manchester Regulations made under the Dairies, Cowsheds, and Milkshops Orders; (2) to carry out the duties of Veterinary Inspector in the working of the Milk Clauses contained in the Manchester General Powers Act, 1899.

The latter duties include the inspection of cows in the City cowsheds, as well as the cows on the farms outside the City boundaries from which milk has been sent in.

Manchester Cowsheds.

These number 134 on 73 farmsteads, and house about 1,100 cows.

In carrying out the regular inspection of the farms within the City boundaries, 510 visits have been paid and 897 inspections of cowsheds made.

These numbers will indicate that repeated visits have been paid to the farms, and that the cowsheds have been inspected fairly often. As mentioned in a previous report, no attempt is made to inspect all farms the same number of times. There are some farmers whom nothing but persistent and repeated visiting will bring to realize what is required for compliance with the regulations; on the other hand, there are those, fewer in number, who can be trusted to keep their premises clean.

On the whole, the work of the year is not unsatisfactory. I have not had to complain much to the cow-keepers about want of cleanliness. All that is necessary is to draw their attention to the fact that a breach of the regulations is being committed, and it is rare that the same farmer has to be spoken to again for some time.

I do not mean to imply by the above that a model standard of cleanliness has been attained, nor is such a standard likely to be attained yet—but I think, undoubtedly, progress has been made. The public might greatly assist. If they indicate to the cow-keepers that they require them to fulfil certain conditions, there is little doubt that the producers will have to comply.

The work of reconstructing the insanitary cowsheds is making steady progress—slow it is true, but such work must of necessity be slow. During the year 1903, 16 farms have been dealt with, and the position at the end of the year was as follows: In 7 instances the alterations or rebuilding necessary to comply with the regulations have been carried out. In two of these cases the cowsheds were quite unfit for alterations, and entirely new buildings have been erected; in 7 of the remaining cases plans and specifications were sent out showing how the existing insanitary cowsheds could be altered. Of the remaining two farms, one has been closed as unfit for cow-keeping, the owners declining to do anything; and in the other case, two cowsheds out of three at one farm were reported as not complying with the regulations, it being found impossible to suitably reconstruct these buildings.

In the 7 cases in which plans and specifications have been sent out, undertakings have been given that the work will be proceeded with during the summer months, when the cows are out of doors.

The faults found at these farms have been mentioned before, and are, briefly, deficiency of light and ventilation, imperfect floors, bad drainage, and want of ventilation. Outside the cowsheds themselves it is found that the yard surface is in a bad state, and that there is usually either a very bad middenstead or no middenstead at all.

In dealing with these farms an endeavour has been made to pick out the worst and deal with them first, and the procedure followed is, briefly: I visit the farm in question accompanied by Mr. Hudson, C.E., full measurements are taken, and a plan is made of the existing buildings. Mr. Hudson then prepares, under my direction, alternative schemes, showing how these buildings can be satisfactorily reconstructed, and when something definite has been arrived at, these are submitted to the Medical Officer of Health for his approval. The amended plan, along with the specification, is then forwarded to the farmer, and along with it a letter pointing out the fact that his cowshed is insanitary.

In many cases it has been found very difficult to devise a satisfactory scheme, so extraordinarily situated are some of the old buildings, and taking into account the necessity of providing accommodation, such as provender room, dairy, etc.

The question of cost is one, of course, which enters largely into the subject, and due regard must be paid to the fact that one must be as economical as possible in making one's demands. There is a tendency to put jerry work into these alterations, which has to be kept in check.

Detail work with regard to the structural alterations, arrangement of stalls, construction of floor, ventilation, light, etc., has been gone into in earlier reports; there are two points, however, which seem to me to be worthy of mention. It has been the practice, in the past, to ask in the specification of alterations for a drop of three inches in the heelstone. This, however, is not in my opinion sufficient, and from the small experience I have had of greater falls from bed to dung-drop, I am of opinion that this is one of the greatest factors in keeping the cow's bed clean, and so also keeping the cow herself clean. The disadvantage of the smaller drop is that, this being insufficient to inconvenience the cow to any great extent, when lying over the end of the bed she may be, practically, in her own dung.

It may be said, of course, that it is the duty of the farmer to see that sufficient dung do not accumulate in the channel to allow the cows to get dirty. It is not feasible to be continually removing the solid excreta, and I believe that a 9in. or 10in. drop, for a channel 18in. or 2ft. wide would meet the requirements of most cases.

The other detail affecting the same point, namely, the acquisition of a clean bed, is the height of the division between the head and the feeding passage. It has been the practice in many instances to erect a 9in. wall two or three feet high in front of the cows, and the result is that the cows are easily able to reach over into the passage, and in fact will do so, particularly if there be any hay or other feeding material stored there.

It is quite unnecessary to put in any brickwork. All that is requisite is to put across the front of the stalls rails fixed on to the front or feeding-passage end of the stall up to the height of 5ft. or 5ft. 6in., the rails to be close enough together to prevent the cows trying to put their heads through; or, on the other hand, the upper portion might be utilised to make a hay rack. Both, however, answer their purpose.

It may seem that undue importance is attached to these two apparently simple details, but when it is considered that in the reconstruction of the old cowsheds one of the main—in fact the main—object from the human point of view is the provision of an easily-cleaned floor, and a bed on which the animals may lie without getting dirty, it will be seen that these details affect the chief object of the provision of model or up-to-date cowsheds.

It may be said in objection that such a height of heelstone as that advocated would be dangerous. In practice, however, it is not so, the cows soon getting used to it, and taking care to lie well on the bed.

The suggestion is not a new one, but is, I believe, the method adopted in Denmark, and also in some of the up-to-date cowsheds in Scotland.

In all reconstructed and new cowsheds, a smooth surface is provided on the walls at the back and side of the cows for cleansing purposes. The dirt which accumulates is scraped off—it is very rarely that a cowshed is washed out, although water is laid on in many of them, this being in part due to the fact that the water used passes through a meter, and is paid for accordingly, and the result is that unless a careful watch is kept the cowkeeper will return to the old source of supply for watering the cattle, cleansing cans, etc.

Mention was made in the last report that the cooling of milk before delivery was practically unknown in the Manchester farms, and it is due to the fact that there is no demand for thoroughly cooled milk. One farmer, however, was induced to cool his milk before retailing it, and the result was that in the first instance he lost a good many customers, and had complaints that the milk was cold instead of warm as it used to be; after many difficulties in explaining matters to his customers, it is satisfactory to note that he has more customers now than ever he had, and there are no complaints about milk going bad after being in the house only a few hours. It is found that the

milk keeps good for 12 hours longer than it used to do. As a matter of fact, the cooling process is of the crudest possible character, and merely consists in standing the large churns or tankards containing the milk in the water trough for about half an hour or so; the result is, however, satisfactory.

Manchester Cows.

During the year 1903 a total of 9,549 examinations were made of cows in the City cowsheds. The average number of cows kept in Manchester is about 1,100, so it is apparent that these cows have all been examined several times. These frequent and unexpected visits have an excellent effect in keeping the cowkeepers up to the duty of keeping the cattle clean.

The standard of excellence of the Manchester cows has, on the whole, been well maintained, and the animals kept are thoroughly satisfactory. The cowkeepers know that nothing but good healthy animals will meet the requirements of the authorities, and the care which is taken in purchasing fresh animals shows that the efforts of the authorities have not been without effect in improving the cattle kept in the City. It does not follow that the animals purchased are the most profitable from the milking point of view, as some of them are anything but prolific milkers; they are, however, good hardy healthy animals, the majority of which fatten readily for the butcher, so that what is lost in milk may be regained in this respect.

I do not mean to infer by these foregoing remarks that there is nothing to complain about, for it is occasionally found that a farmer has been tempted into purchasing a cheap animal. These cases, however, have certainly diminished, as it is well known that in such cases, when the animal is discovered, the profit to the farmer is likely to be converted into loss.

A striking contrast is seen when fresh purchases are introduced into the town dairies. The newly purchased animal being as a rule in a much poorer condition as well as being very dirty, it depends somewhat, of course, upon the part of the country from which the cows come, and applies more particularly to districts which are not well favoured in respect of good rich pasture land.

These cows, however, do very well as a rule; they are undoubtedly for the most part healthy hearty animals, and put on flesh rapidly when fed on the good food given to the cows in Manchester.

It is satisfactory to report that during the year no case of tuberculosis of the udder has occurred among the cows in Manchester. Several cases of udder lesions have, however, been investigated, and the bacteriological examinations have proved that these were not tuberculous.

Two cows were found during the year to be suffering from advanced tuberculosis (not in the udder), and were slaughtered at the abattoirs. The carcases were inspected by Mr. Holburn, and in both instances condemned as unfit for food.

The Manchester Milk Clauses.

There have been no changes in the methods adopted in the working of the Milk Clauses of the General Powers Act, 1899.

Samples of milk are taken at the Manchester Railway Stations, or elsewhere within the City, by the Food and Drug Inspectors. These are submitted to Professor Delépine for bacteriological examination. All samples reported by him as having been found to cause tuberculosis are followed to their source at the farm by the Medical Officer of Health (or his representative) and the Veterinary Surgeon.

The Veterinary Surgeon examines all the milking cows on the farm, and takes samples of milk from all cows having diseased or suspicious udders. The special samples are taken in sterilised vessels provided by Professor Delépine, and every care is taken to avoid extraneous infection. These samples are in turn submitted to Professor Delépine for bacteriological examination, and in this way the fact of a cow having tuberculosis of the udder is definitely proved. Samples from cows found to have suspicious or diseased udders by clinical examination, without previous station samples, are examined in the same way.

In all cases control samples are taken to ensure that the examination has been satisfactory and the source of infection removed.

Tuberculous Milk.

It has been already stated that 9,549 inspections of cows were made in the Manchester cowsheds during the year; and as a result of these inspections no cow was found to be suffering from tuberculosis of the udder.

During the year 432 samples have been taken at the various railway stations by the Food and Drug Inspectors in connection with Tuberculosis, and the number of farmers represented in this total is 329.

Of these 329 farmers, 210 reside in Cheshire, and 31 of them (14·76 per cent.) sent tuberculous milk; 73 live in Derbyshire, and 7 of them (9·58 per cent.) sent tuberculous milk; 33 reside in Staffordshire, and 5 of them (15·15 per cent.) sent tuberculous milk; 5 live in Shropshire, and 2 of them (40·00 per cent.) sent tuberculous milk; 10 live in Lancashire, and none of them sent tuberculous milk.

It should be explained that the two Shropshire samples found to cause tuberculosis were taken from the milk sent in by a large dairy. This same dairy also came under notice in 1902 as sending a quantity of infectious milk into the City, and a prolonged investigation was made into the condition of the farms. This milk does not now come to Manchester.

It will be seen by the totals given that from 329 farms 432 samples were collected. This means, of course, that the milk of certain farms has been collected more than once.

From returns supplied by the farmers themselves to the Tuberculosis Office, the estimated number of cows at these 329 farms is 6,251, equalling an average of 19 cows per farm, and in following up the 45 tuberculous station samples the udders of 2,537 cows have been examined. Of the milk tested by Professor Delépine from the 329 farms, 45 were found to cause tuberculosis, giving a percentage of 13·67 farms sending tuberculous milk.

As a result of following up the tuberculous station samples, a total of 28 cows were found and pronounced to be suffering from tuberculosis of the udder; 20 were slaughtered in my presence, and in 14 instances the carcases were so extensively tubercular as to be unfit for food; in the remaining six instances the carcases were only slightly affected, and were fit for food. So far as the disposal of six of the cows is concerned, nothing is known or could be ascertained, although enquiries were made. In the remaining two instances the cows died shortly after the visit of the Veterinary Surgeon.

In addition to the above 28 cows, which were found as a result of following up infected station-milks, one cow was notified by a farmer as having symptoms suspicious of tuberculosis of the udder. The cow was examined, and the sample of milk submitted was reported as having caused tuberculosis; the farmer sent the cow, which had been an exceptionally heavy milker, to the knackers.

Thus, during the year, 29 cows, in all, have been proved to have been suffering from tuberculosis of the udder, and, as is shown, the ultimate disposal of 23 of these diseased animals was ascertained.

These 28 cows (the notified case excluded) were discovered at 27 farms, so that at one farm two cows suffering from tuberculosis of the udder were found.

It has been stated that in 45 instances the station milk was reported infective. It will be thus seen that in 18 instances the source of infection was not discovered. Two of these instances might well be excluded, as the milk came from a dairy in Shropshire, and it was found impracticable to follow the milk up to the farms.

It is rather noticeable in the returns of the last three years that the percentage of milks found to cause tuberculosis shows no decrease, in fact rather the opposite, as the short table appended will show :—

Year	Number of farmers' milk tested during the year	Total number found to cause tuberculosis in the experimental animal	Percentage of farmers from each county whose milk was proved to contain tuberculosis				
			Cheshire	Derbyshire	Staffordshire	Salop	Lancashire
1901	272	27	10·46	9·23	8·00	10·00	...
1902	345	36	12·72	8·65	4·01	...	8·31
1903	329	45	14·76	9·58	15·15	40·0	...

In this table the column showing the figures for Cheshire is the most important, for the greatest quantity of Manchester milk is derived from that county—the other four counties mentioned sending a comparatively small amount. The explanation of this steady rise is, I think, due to two circumstances :—

(1) More supervision has been exercised in the taking of mixed samples at the railway stations, and there has not been so much unnecessary repetition in collecting milk from the same farm at short intervals.

(2) The growing difficulty in the diagnosis of tuberculosis of the udder. There is little doubt that as soon as most farmers notice anything wrong with a cow's udder their chief desire is to get rid of the animal at once, and in many cases the cow is sold in open market as a milking cow. If there is some want of similarity in the size and shape of the quarters of the udder, the remedy of overstocking the smaller quarter is resorted to to give an even appearance, with the result that such an animal is frequently lost sight of, and may possibly be the source of infected milk from another farm.

As against the increased proportion of station samples which have proved to be tuberculous, it is to be stated that it is now rare to find udders in an advanced stage of disease, as happened formerly.

Earlier in the report, it is mentioned that out of 28 cows proved to be suffering from tuberculosis of the udder, in only six instances was the carcase fit for food, while in 14 instances the carcases were condemned.

In every case where a cow is proved to have tuberculosis of the udder the farmer is urged to slaughter as soon as possible, for if there is any chance of the carcase being passed for food the sooner the animal is killed the better.

Instead of this, however, their owners in most cases prefer to keep the animal for a time, give the best of food, and try to fatten them up, the result in most cases being that the carcase is worthless. As a rule, when a cow is found by me she is in full milk, or nearly so, and it is foolish to try and dry off the cow to feed her. In addition, the Act requires that the cow be isolated from the rest of the milking herd, and it is well known that to take a cow away from the rest means that she will not feed, and is generally restless and fretful. One has only to see such an animal to appreciate the condition and to recognise the utter impossibility and unwisdom of trying to fatten such an animal.

On the whole, I think I may say that the condition of the country cows examined by me during the year was fairly satisfactory—that is to say, with regard to their condition. They do not, of course, come up to the standard of the cows kept in Manchester. Although in some of the larger herds in Cheshire, and one in Staffordshire, I have seen some very fine animals, in the other counties the conditions are not so good. As regards the housing of the cattle, the condition of affairs remains practically as it was, the old, insanitary, dark, ill-ventilated, badly drained, and nauseous cowsheds being as numerous as ever, and it is a great pity to keep animals which have to produce milk under these conditions.

Certain rural districts in Cheshire have, as I have previously mentioned, attempted to administer the Dairies, Cowsheds, and Milkshops Order, and may be with some amount of success, but there is no uniformity of administration or in the requirements.

Each local authority may or may not administer the Act—in some cases alterations are made to old cowsheds, with, as a rule, very little improvement on the previous state, and there is no doubt that so long as the persons chiefly affected have the administration of this Act, so long will matters remain as they are. It is hopeless to try and free the milking cows from tuberculosis so long as they have to live in such hothouses of disease. The only clause of the Dairies, Cowsheds, and Milkshops Order which is carried out, so far as seen by me, is that which requires periodical whitewashing.

I am willing to recognise that certain landlords have done, and are doing, their duty with regard to this important matter, but they are in the minority, and even then their advisers are often imbued with the idea that it is dangerous to give a cow a few hundred feet of cubic space, or that, if ample cubic space is provided, there must be a minimum of ventilation or light, and the sooner the fact is appreciated that a cow is not a delicate animal, which must be kept cooped up in a hot stuffy building, in which the very crevices of the door or window (if present) are covered over with sacking or other material to keep out the draught, the better for the cow-keepers and the cows themselves.

I have mentioned that certain rural districts in Cheshire have tried to improve the condition of their cowsheds, but I do not know of any other county from which the milk supplied to Manchester is derived that has done anything, and several of these counties are as deeply interested in the dairy industry as is Cheshire.

In a certain district in Derbyshire a meeting of farmers was held some little time ago chiefly to protest against the administration of the Milk Clauses of the Manchester General Powers Bill. There was only one opinion, and great enthusiasm prevailed. Now in this particular district I have visited a good many farms, and have inspected a fair number of cowsheds, and not one good cowshed have I seen; they were mostly very dirty, as were the cattle housed therein.

I stated in last year's Annual Report that I was of opinion that far too great a proportion of the milk supply was in the hands of small farmers, and that as a class they were ignorant and prejudiced. Since then I have very carefully considered this statement, as many protests were made that I had been unfair.

I see, however, no reason to withdraw anything I then said, in fact I am more strongly of opinion that there are very many of these men who keep a few cows who are, judging by their habits, absolutely unfit for the business they have in hand: they will not profit from what they are told, and prefer to plod along in their old methods.

There is no desire to be unnecessarily hard on these people, but the milk trade should be in the hands of those who are willing and able to progress, and in their habits at least are cleanly.

I think that, so far as the cleanliness of the cows is concerned, in some parts of Cheshire decided progress is shown, and the cows are cleaner kept than used to be the case. I do not think I can say anything satisfactory about the remainder of our milk-supplying districts. There may be isolated cases in which care is taken to keep the cows clean, but they are few.

So far as the cleanliness of the milkers is concerned there is also great room for improvement, and the milkers at a farm are often a nondescript collection, who may or may not have washed their hands, while their clothes, as is natural from the nature of farm work, are dirty. I do not expect every one of these people to change their clothes, but it is surely not too much to ask that they should have to wear clean milking smocks. It is a great pity that female milkers are rarely seen now; they are, as a rule, far better and cleaner milkers than men, besides being cleaner in their clothing and habits.

The dairy conveniences have at all farms been inspected, and it is surprising,

even at the best farms, how little attention has been paid to this important feature. Certain definite and proper provision should be made for handling the milk after it leaves the cowshed. Too frequently the dairy is nothing but an open shed or scullery, and in many instances is used as a washhouse, coal store, and general receptacle for loose articles. A dairy should be properly constructed so as to be easily cleansed, and used for no other purpose than as a dairy.

The water supply at the farms has always been inspected, and a note is made as to the probable condition of the water, particularly the water used for can washing. Lately, however, acting under the instructions of the Medical Officer of Health, where I have had cause to suspect the water as contaminated a sample has been collected and submitted to Professor Delépine for bacteriological examination, and no doubt valuable evidence will be collected as to the condition of the farm water supplies. There is little doubt, however, that at comparatively few farms is the water supply free from pollution, and the subject is a very intricate one, presenting many difficulties before it will be possible to have a good water supply to every farm.

In two large Cheshire districts, however, a great deal has been done in this respect and at considerable expense. The farms have been supplied from a public water supply, but even in these cases the cows are allowed to drink at pits, etc., which are polluted. There is a prevalent idea among farmers that cows always prefer to drink dirty stagnant water containing a large amount of decomposed animal and vegetable matter, and that they do not care about a good, clean, pure water. This opinion is almost as erroneous as the practice is filthy. Some cows who suffer from forms of indigestion may prefer dirty water, and I believe in some cases do eagerly drink water off clay. Healthy cows, however, should have a plentiful supply of good pure water.

This opens up another question connected with the treatment of dairy cows, and refers particularly to the method of watering. It is the usual practice to turn the cows out to water twice daily, to drink either at a trough or pond, as the case may be; this, of course, applies only to the Winter months, and to those cases in which the animals are housed the whole year round. The result is that some of the cows drink greedily and others very little, and I am firmly of opinion that the tied-up animals do not get nearly enough liquid. Veterinary practitioners are aware how very common attacks of indigestion, stoppage, etc. are in cows so kept. A constant supply of good drinking water should be provided in the cowshed, so that the cow may drink whenever she feels inclined, and at shorter intervals. Anyone who has seen the result of letting cows, or for that matter any other animal, have water whenever they require it, cannot help but be struck by the great improvement in the condition of the animals, and, further, the cases of digestive derangement quickly cease.

Every effort is made to impress upon farmers the necessity for absolute cleanliness in every detail, and it occurs to me that the milk dealers at this end might also do something instead of returning cans dirty, which have probably been lying about their premises for a week or more.

The Railway Companies should certainly provide proper carriages for milk; they draw a very considerable revenue from the dairy industry, and in return should provide adequate and proper conveniences for the transit of milk. I referred to this last year, and and lately have noticed that the vans in which the milk has been brought to Manchester have been vans used for the fish traffic. These vans, while being much better than the ordinary open truck, should be properly cleansed.

Appended are particulars of the disposal of all cows found suffering from tuberculosis of the udder during the twelve months ending December 31st, 1903:—

Case 121.—This cow was found on January 7th, when following up a station sample reported as having been found to cause tuberculosis. The owner was written to by the Medical Officer of Health, and letters were also sent to the Medical Officers of Health for the County and district.

The farmer replied that he would not slaughter the cow without compensation, but that he had isolated her, and that she was being dried off for calving; the local Medical Officer of Health also wrote to the same effect.

The Medical Officer of Health again wrote to the farmer, and pointed out that he did not desire that the cow be slaughtered immediately, but that he should seriously consider the advisability of slaughtering her soon after calving. A similar letter was also sent to the local medical officer of health.

The latter replied in the course of a few days, saying that he had seen the farmer, who had consented to the course suggested by the Medical Officer of Health for Manchester. The farmer also confirmed this on February 24th.

On March 3rd a post card was received from the farmer, saying that the cow had hanged herself in her stall, and was dead when he found her.

The agent for the farm and Dr. Fletcher also wrote confirming this statement, which was accepted.

The Veterinary Surgeon at the time of his first visit to this farm found that the cowsheds were most insanitary and the cows were very dirty, and pointed out to the farmer that such conditions were disgraceful.

The owner of the property called upon the Medical Officer of Health, and undertook to do anything that was required to make the farm a satisfactory dairy farm.

Ultimately, two of the old cowsheds were thrown into one, and another new cowshed was erected—each to hold 20 cows—the whole of the work being carried out according to plans prepared by Mr. Hudson, C.E., of the Sanitary Department.

Case 123.—This cow was found on February 10th as the result of following up a previous infective station sample. The farmer was written to by the Medical Officer of Health, who also wrote to Dr. Reid and the local Medical Officer of Health.

The farmer replied that he had done as he was told by Mr. Brittlebank, and had isolated the cow, and would let the Medical Officer of Health know when she was ready for slaughter. The Medical Officer of Health replied, asking if the statement was to be taken as an undertaking to slaughter in the presence of the Veterinary Surgeon, and the farmer replied giving the necessary undertaking. On July 6th the cow was slaughtered in the presence of the Veterinary Surgeon, who found a fairly good carcase, but the lesions of tuberculosis being extensively distributed it was unfit for food.

Case 124.—This cow was discovered on February 11th as a result of following up an infected station sample. On March 9th the farmer was written to by the Medical Officer of Health, who also wrote to Drs. Vacher and Bennett. In reply the farmer wrote giving the necessary undertaking to slaughter in the presence of the Veterinary Surgeon. The cow was slaughtered on March 18th, and the carcase, only being slightly affected, was passed for food.

Case 125.—The first cow in this case was discovered by the Veterinary Surgeon on February 12th, at the same time a control sample was taken excluding the animal above referred to, and Professor Delépine reported that both the special sample and the control had been found to cause tuberculosis.

Along with the representative of the Medical Officer of Health, the Veterinary Surgeon again returned to the farm and examined the cows, 51 in number, and discovered another cow suffering from tuberculosis of the udder; in both these cases the symptoms of disease were very slight, in fact in the udder of the second cow there were no signs of disease at the first visit on February 12th, but a month later some slight symptoms were present.

The farmer was written to by the Medical Officer of Health, who also wrote to Dr. Reid and the local Medical Officer of Health.

The farmer replied that the cows had been isolated and were not being milked, but gave no undertaking to slaughter. The Medical Officer of Health again wrote asking for an undertaking. The farmer replied that the cows might be ready for slaughter in about two months, but would give no undertaking as required, and although he was again written to on two separate occasions no information as to the ultimate disposal of the cows could be obtained.

Case 126.—The cow in this case was found on February 23rd when following up a previous infective station sample. The Medical Officer of Health wrote to the farmer, and also to Dr. Barwise and the District Medical Officer of Health. In reply, the farmer wrote asking permission to sell the cow, but on the same date the Medical Officer of Health wrote urging the farmer to comply with his request for slaughter. On May 26th the farmer again wrote saying that the cow was dry, and asking if he might sell the cow to Mr.W———, naming a man who is a well-known dealer in animals of this description. In reply to this letter the farmer was notified that the case had been reported to the Hospitals Sub-Committee, who had decided to prosecute. By return of post the farmer wrote expressing his willingness to slaughter the cow whenever it was convenient to the Veterinary Surgeon, and ultimately decided upon slaughtering the cow on June 11th.

On this day the Veterinary Surgeon attended, and witnessed the slaughter of the cow. The disease was found to be very widespread, and the carcase was unfit for food.

This information was conveyed to the Hospitals Sub-Committee, who withdrew their resolution to institute a prosecution.

Case 127.—This cow was found on September 15th by the Veterinary Surgeon when visiting the farm in connection with a previous tuberculous station sample. The Medical Officer wrote to the farmer and to Drs. Vacher and Rushton.

The farmer replied that he had sent the cow to his father, who was not a milk seller, as she was near calving. The Medical Officer of Health pointed out in reply that all he required was an undertaking to slaughter in the presence of the Veterinary Surgeon, and that he (the farmer) was quite at liberty to keep the cow until she calved.

A few days later the Veterinary Surgeon, being in the district, called upon the farmer and obtained the necessary undertaking; by the following morning's post, however, a post card was received saying he had decided to slaughter the cow that day.

The Veterinary Surgeon attended and inspected the carcase, which was a good one, and fit for food.

Case 130.—This cow was found on March 23rd in the usual way when visiting, subsequent to a tuberculous station sample. The Medical Officer of Health sent out the usual letter, and a few days later received a reply from the Secretary to the Cheshire Milk Producers' Association, stating that the cow was isolated, that the milk would not be sent to Manchester, and that the cow would be fattened. To this letter the Medical Officer of Health replied that it was necessary to have the undertaking to notify time, date, and place of slaughter, so that the Veterinary Surgeon might attend. To this letter the Secretary replied that if was premature to discuss slaughter, and that the milk from this cow would not be sent to Manchester again, as stated in his previous letter. Further correspondence followed, and ultimately the cow was slaughtered on June 16th, the Veterinary Surgeon being in attendance, as was also the Secretary to the Cheshire Milk Producers' Association. The carcase was a good one, and quite fit for food.

Case 131.—This case is mentioned, though no farms were visited. Out of 3 samples of milk taken at the railway station, two were found to cause tuberculosis. The milk was from a large dairy in Shropshire which had previously been the subject of an extended enquiry, the report on which was included in the Annual Report for 1902.

As on the previous occasion, the representative of the Medical Officer of Health, accompanied by the Veterinary Surgeon, called upon the dairyman, and asked to be supplied with a list of names of farmers whose milk was sent to Manchester on February 26th, so that the farms might be visited and the source or sources of infection ascertained. This information was declined, and the case had to be dropped, as it was found that the Milk Clauses had not been advertised in this County as required by Sub-Section 7, Section 19. Since that date, however, no more milk from this particular supply has been sent to Manchester.

Case 132.—This cow was found on April 6th by the Veterinary Surgeon when visiting in connection with a previous station sample. The usual letters were sent out by the Medical Officer of Health to the farmer, and Dr. Reid, the local Medical Officer of Health, was also notified.

On April 18th the farmer wrote saying that he had arranged for the cow to be slaughtered on April 20th, and on that date the Veterinary Surgeon attended and witnessed post-mortem in company with Mr. Hill, F.R.C.V.S. (for the owner). The carcase, being extensively diseased, was condemned.

Case 133.—This cow was discovered in the usual manner by the Veterinary Surgeon on April 7th. The farmer was written to by the Medical Officer of Health, who also wrote to the Medical Officer of Health for the County and District. The farmer replied that the cow had been dried off and isolated, and on the same day the Medical Officer of Health again wrote asking that the usual undertaking to notify date and place of slaughter be given. No reply being received to this letter and subsequent ones, the farmer was summoned to appear before the Committee to show cause why he should not be prohibited from sending milk into Manchester, the action being taken in consequence of the Medical Officer of Health reporting to the Committee that he was of opinion that tuberculosis was likely to be caused to persons within the City by consumption of the milk from this farm. The conditions of production as reported by the Veterinary Surgeon were lamentable, the cows being dirty, and undoubtedly in two cases the subject of fairly advanced tuberculosis (in addition to the cow with tuberculosis of the udder), and the buildings were insanitary to a degree—in fact no good word could be said for the place.

In reply to the summons to attend the meeting of the Committee, the farmer wrote that the cow had been destroyed, but not for human food, and expressed the opinion that it would not be necessary to attend the Committee meeting.

Ultimately, on September 21st, the Hospitals Sub-Committee made the necessary order to cease sending milk to Manchester.

On October 19th the farmer wrote saying that his landlord was making such alterations as were necessary to his buildings. Finally the alterations required by the Medical Officer of Health and the Hospitals Sub-Committee were carried out. On November 16th the order prohibiting the sale of milk was withdrawn.

Case 135.—This cow was found on May 16th as usual when following up a tuberculous station sample. The Medical Officer of Health sent out the usual letters, and in reply the farmer wrote: "The cow is going on all right, and as soon as she is fit for the butcher will let you know." On September 12th another note to the same effect was received, and ultimately in November the farmer wrote saying that he was sending the cow to the Harrington Bone Works, where the carcase was seen by the Veterinary Surgeon. This case is a good example of trying to feed a diseased cow, as it will be seen that the cow was discovered on May 16th and that the farmer kept her until November 25th, when she became so weak that she had to be killed. It is very likely had he slaughtered immediately that some portion, if not the whole, of the carcase would have been fit for food.

Case 136.—This cow was found on May 14th as the result of a previous infected station sample. The Medical Officer of Health wrote to the farmer, and also to the County and District Medical Officers of Health.

The cow was slaughtered on June 23rd at an adjacent farm, and the carcase was found to be unfit for food. Mr. Percival, F.R.C.V.S., Macclesfield, was present on behalf of the farmer.

Case 137.—This cow was found on May 18th when following up a tuberculous station sample.

In reply to the usual letter from the Medical Officer of Health, the farmer replied giving the necessary undertaking to slaughter. This, however, was never carried out, and the ultimate disposal of the cow was not ascertained.

Case 138.—This cow was found on May 25th in the usual manner, after an infected station sample. The Medical Officer of Health sent out the usual letters, and the farmer replied that he would slaughter the cow immediately he could make the necessary arrangements.

The slaughter was ultimately carried out at Kingsley, the Veterinary Surgeon being present. The carcase, though not very extensively diseased, was unfit for food.

Case 139.—This cow was found on June 8th when following up a previous tuberculous sample.

In reply to the usual letter from the Medical Officer of Health, the farmer replied that he would make arrangements for slaughter, and that he would notify when his arrangements were complete.

On July 15th the cow was slaughtered in Middlewich, and although the carcase was in very fair condition the tubercular lesions were very widespread, and the carcase was condemned.

Case 141.—This cow was found on September 9th by the Veterinary Surgeon when following up a previous infected station sample.

The Medical Officer of Health wrote to the farmer and the Medical Officers of Health for the County and District.

No information could be ascertained as to the ultimate disposal of the cow.

Case 142.—This cow was discovered on September 18th in the usual manner when following up a previous tuberculous station sample.

The Medical Officer of Health wrote to Drs. Vacher and Garstang, and also to the farmer, who replied that he was sending the cow to the Manchester abattoirs to be slaughtered.

The carcase was inspected by Mr. Holburn, and found to be fit for food.

Case 145.—This cow was found as a result of following up a previous infected station sample.

The Medical Officer of Health wrote to Dr. Vacher and to the Medical Officer of Health for the District, and also to the farmer.

Dr. Kenyon, the Medical Officer of Health for the district, replied that he had been informed by the farmer that the cow had got rapidly worse after the visit of the Veterinary Surgeon, and that they killed and buried her. This is very likely to be correct, as the cow was ill at the time she was found, and there then seemed but poor prospect of recovery.

Case 147.—This cow was found on September 15th in the usual way when following up a tuberculous station sample. The Medical Officer of Health wrote to Dr. Vacher and the local Medical Officer of Health, and to the farmer, who replied that he had isolated the cow from the time the Veterinary Surgeon had condemned her, and that she would be slaughtered on October 26th. On that date the Veterinary Surgeon attended and witnessed slaughter. The carcase was in fair condition, and proved to be free from lesions, which were, as is so often the case, practically confined to the mesenteric glands. The carcase was fit for food.

Case 150.—The station sample having proved to cause tuberculosis, this cow was found subsequently on September 14th. The usual letters were sent out by the Medical Officer of Health, and the farmer replied that he would slaughter the following week, and would give timely intimation so that Mr. Brittlebank could be present. From this date, however, no more was heard until on the 16th November the Medical Officer of Health wrote and pointed out that this having been reported by the Veterinary Surgeon as a well-marked case, it would have to be reported to the Hospitals Sub-Committee. Following this letter arrangements were immediately made by the farmer to slaughter, and this was carried out on December 3rd, the carcase being extensively diseased and unfit for food.

Case 151.—This cow was found by the Veterinary Surgeon on September 14th when following up a previous infected station sample. The Medical Officer of Health wrote to the farmer, and to Dr. Vacher and the local Medical Officer of Health. Arrangements were made by the farmer to slaughter the cow on the 20th October, on which date the Veterinary Surgeon attended and found that the carcase was very extensively affected, and was quite unfit for food.

Case 153.—This cow was discovered in the usual manner on October 14th when following up a station sample. The usual letters were sent out by the Medical Officer of Health, and arrangements were immediately made by the farmer to slaughter the cow at Dunham-on-the-Hill on November 16th.

The post-mortem was made on that date and the carcase was found to be quite unfit for food, in fact the carcase was one of the most extensively diseased that has been seen by the Veterinary Surgeon, and in addition the cow had only recently had her first calf, the disease in the udder being much more frequently met with in much older animals.

Case 154.—This cow was discovered by the Veterinary Surgeon when visiting in connection with a previous infected station sample.

At the first visit on October 15th nothing could be found, but a control sample from the whole herd was taken, which was reported on December 14th as still causing tuberculosis. The farm was again visited, and on this occasion the cow was found.

The usual letters were sent out by the Medical Officer of Health, and in reply the farmer wrote asking for permission to graze the cow and try to feed her. This was at once assented to, but it was pointed out that the cow must be isolated from the remainder of the herd, and at the same time pointing out that, in the opinion of the Veterinary Surgeon, this was a case in which it would be useless, and only a waste of money to try to feed.

However, the cow was not slaughtered until March, when it was found that the tuberculous lesions were fairly extensive though recent, and the carcase was condemned.

Case 155.—This cow was found on December 22nd by the Veterinary Surgeon when visiting in connection with a previous tuberculous station sample. The Medical Officer of Health sent out the usual letters, and in reply received a letter from the farmer, saying he had sold the cow in question shortly after the Veterinary Surgeon's visit.

The Medical Officer of Health replied, asking for the name and address of the purchaser, and the farmer replied that he had sold the cow to Mr.———, Macclesfield.

The Medical Officer of Health wrote to this man, who is a well-known purchaser of such animals, who replied that he had slaughtered the cow, and that there was nothing the matter with her.

Case 156.—This cow was found on October 21st in the usual way by the Veterinary Surgeon.

In reply to the Medical Officer of Health, the farmer wrote that he had made arrangements for slaughtering the cow on January 8th, and on that date the Veterinary Surgeon attended and found the carcase very extensively diseased and unfit for food.

Case 158.—This cow was found on November 11th by the Veterinary Surgeon when visiting in connection with a previous station sample. The usual letters were sent out, and on November 18th the farmer called to see the Medical Officer of Health, and ridiculed the Veterinary Surgeon, saying that the cow was fat, and quite well. However, he consented to slaughter the cow in the Manchester abbatoirs, along with some others that were ready for the butcher, when it was found by Mr. Holburn that the carcase was not fit for food, and was condemned.

Case 161.—This cow was found in the usual manner by the Veterinary Surgeon. When written to by the Medical Officer of Health, the farmer arranged to slaughter at Helsall. The carcase was examined by the Veterinary Surgeon and found to be fit for food.

Case 163.—This cow was found when following up a tuberculous station sample. The farmer arranged to slaughter immediately, and confirmed this when written to by the Medical Officer of Health. The Veterinary Surgeon witnessed slaughter of the cow at Sheldon, Derbyshire, and found the carcase quite unfit for food.

Case 164.—*Notification.*—On December 1st the farmer wrote requesting that the Veterinary Surgeon might visit, as he had a cow he was suspicious about. The Veterinary Surgeon accordingly visited and examined the cow, and found that the left hind quarter was certainly suspicious of tuberculosis, and this was confirmed by the inoculation test.

The farmer wrote to the Medical Officer of Health that he had sent the cow to the bone works, as she had got rapidly worse. This was confirmed by the local Medical Officer of Health.

J. W. Brittlebank, M.R.C.V.S.

THE FACTORY AND WORKSHOP ACT, 1901.

The work done under this Act for the twelve months ending April 30th, 1903, is summarised in the Report of the Sanitary Superintendent for 1903, as follows :—

Showing the work done by the Inspectors under the Factory and Workshop Acts in the year 1903
(May 1st, 1902, to April 30th, 1903).

Number of District	INSPECTOR	WORKSHOPS								BAKEHOUSES					
		Number of visits	Number in which Sanitary defects were found	Number of reports referred to Factory Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits to houses where out-workers are employed	Factories and Workshops not provided with proper means of escape in case of fire	Number of visits	Number in which Sanitary defects were found	Number of reports referred to Factory Inspector	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
1	Richard Tolson.....	3819	209	145	4	288	1347	2	2	447	13	2	...	12	87
2	Thos. Partington ...	2928	211	93	7	231	1007	97	7	967	73	7	...	14	180
3	Ernest Bailey ...	2816	225	58	2	138	933	13	1	1013	114	1	...	6	142
4	Francis J. Rowe ...	3428	305	143	3	267	1142	43	3	639	21	7	...	5	134
...	Emma Coppock ...	2096	252	1	28	...	...	1185	...	...	...	...	...	...	...
...	Margt. L. Brown ...	1548	128	...	16	...	...	2045	...	...	...	...	...	...	...
...	TOTALS	16635	1330	440	60	924	4429	3385	13	3066	221	17	...	37	*543

* 140 are cellar bakehouses.

The work done during the 12 months ending December 31st, 1903, has been taken out for me, on a form, which follows closely those sections of the Act which lay special duties on the Workshops' Inspectors.

The sections of the Act relating to bakehouses have not been included in this return. These have been the subject of a special report to the City Council, and will be briefly dealt with separately.

Action taken under the Factory and Workshop Act, 1901, arranged according to the Sections of the Act.

Action taken under Sections of the Factory and Workshop Act, 1901, during the year 1903	Workshop, &c., Inspectors					
	Bailey	Rowe	Partington	Tolson	Coppock	Brown
Section 2. (1) Workshops found not cleanly.....	99	84	63	106	57	15
Nuisance abated	99	84	63	106	57	15
Prosecutions	...	2	3	1	...	1
Workshops not properly ventilated ...	9	7	9	14	18	3
Observations made	...	17	...	...	...	...
Tests of air made	...	17	...	...	...	...
Nuisance abated	...	...	...	...	...	...
Prosecutions	...	...	...	...	...	...
Overcrowding found	...	...	1	1	2	4
Nuisance abated	...	...	1	1	2	4
Prosecutions	...	...	...	...	...	...
Section 2.—(2) Instances in which a closet was found to communicate freely with the interior of a workshop	1	3	3	1	3	...
Instances in which action was taken.....	1	3	3	1	3	...
Section 2.—(3) Lime washing, cleansing, or purifying necessary for the health of persons employed in a workshop. Instances in which action was taken	187	117	222	180	185	112
*Section 7.—Provision and maintenance of ventilation. Maintenance applicable only to young persons and females	9	7	9	14	18	3
Section 8.—Wet floors drained, laundries, pickle-works, bottlewashing, etc.	6	1	2	2	...	...

* See page 168.

Action taken under Sections of the Factory and Workshop Act, 1901, during the year 1903	Workshop, &c., Inspectors					
	Bailey	Rowe	Partington	Tolson	Coppock	Brown
Section 9.—Sanitary conveniences provided, P.H.A.A.	8	7	20	17	6	...
Section 14.—(1) Certificates that factories and workshops are provided with means of escape in case of fire.	1	1	3	2	...	...
Section 14.—(2) Number of notices served, specifying the provision required of means of escape in case of fire.	2	3	9	1	...	...
Section 16.—(6) Maintenance of means of escape in case of fire.	...	...	3	1	...	...
Section 74.—Instances coming to the knowledge of the inspectors in which special fans have been provided for the immediate removal from operatives of dust, gas, vapour, or other impurity.	...	...	...	...	...	...
Section 103.—Workshop laundries. Instances in which action has been taken in respect of ventilation or other sanitary requirements.	No special statement	No special statement	No special statement	No special statement	...	...
Section 107.—(1) Scheduled occupations in which lists of outworkers have been received and examined in 1903.		See	annexed	table.		
Section 108.—Notices given to the Occupier of a Factory or Workshop that any place in which work is carried on for him is injurious or dangerous to the health of the persons employed therein.	...	...	...	...	...	3

Action taken under the Factory and Workshop Act, 1901—*continued.*

Action taken under Sections of the Factory and Workshop Act, 1901, during the year 1903	Workshop, &c., Inspectors					
	Bailey	Rowe	Partington	Tolson	Coppock	Brown
Section 109.—Instances in which wearing apparel has been made, cleaned, or repaired in any house in which a case of Scarlet Fever or Smallpox has occurred, and in which the occupier of the factory or workshop has been apprised.	...	...	...	...	Occupier of workshop not apprised, 4.	Occupier not apprised, 3.
Section 110.—Work given out where any notifiable disease has been discovered, with the action taken thereupon.	...	...	...	...	1	...
Section 111.—Domestic factories and workshops not distinguished.	...	3	3	...	...	...
Section 2.—List of work places to which sub-sections 1 and 2 may be supposed to apply, with any action as yet taken in reference to them.	...	...	...	...	...	...
Section 18.—Power to close an unhealthy or dangerous factory or workshop. Corresponding action taken under the P.H.A., 1875.	...	...	...	...	...	...
Remarks	...	...	..	...	37 houses of outworkers found dirty have been cleansed.	39 houses o outworkers found dirty have been cleansed. 1 prosecution against the occupier of a house in which outwork was done for refusing admission to the Inspector.

The following table shows the kind of work pursued by the outworkers, ts of which are sent to the Sanitary Authority in accordance with section 07 :—

ABLE SHOWING THE NUMBER AND CLASSIFICATION OF PERSONS EMPLOYED AS OUTWORKERS BY FIRMS WITHIN THE CITY, AND THE NUMBER OF SUCH FIRMS IN 1903.

Trades	No. of Employers	No. of Outworkers or Contractors employed
Tailors	184	1003
Shirt-makers	59	960
Dress, Mantle, Costume, &c., Makers	49	506
Underclothing and Pinafores	32	368
Handkerchief Hemmers	18	400
Boot, Slipper, &c., Makers	51	264
Umbrella Trimmers	18	247
Quilt, Cushion, &c., Makers	5	20
Stay and Corset Makers	2	9
Cabinet Makers and Upholsterers	10	21
Hair Pad and Frame Makers	3	8
Paper Bag Makers	2	7
Rubber Workers	3	9
Fur Workers	2	3
Lace Makers	3	8
Optician	1	1
Cap Makers	3	6
Belt and Trimming Makers	2	28
Totals	447	3868

The number of these visited, 3385.

In addition to work thus shown, a number of special reports relating to bakehouses, gas stoves, air tests, and miscellaneous matters have been supplied by the Inspectors in the following proportions :—

Bailey	43
Rowe	41
Tolson	24
Partington	53
Coppock	6
Brown	5

BAKEHOUSES.

During the year 1903, the underground bakehouses remaining in the City were visited by the Shop Hours, etc., Sub-Committee, with the exception of those in regard to which it was quite certain that a certificate would be granted after the necessary alterations had been carried out.

Those visited by the Committee numbered 119, and were sub-divided as follows :—

1. Those in which the City Surveyor was instructed to prepare a specification to the number of 17.

2. Those which the Committee did not desire to see continued, but were willing to consider plans of alterations to, numbering 62.

3. Those which they declined to allow the continuance of under any circumstances, 51.

The form of specification used by the City Surveyor and the principles on which alterations have been prescribed, which are those formulated by the Society of Medical Officers of Health, have been given in the Report for the year 1902. The specifications sent out by the Corporation have been drawn up by Mr. Irvine, of the City Surveyor's Department, in consultation with the Medical Officer of Health, who is indebted to Mr. Irvine for assistance in considering the plans and specifications submitted by Architects.

The Chairman and Sub-Committee have bestowed much care and time on the consideration of individual bakehouses, and have approved of the individual plans and specifications, which have often entailed much trouble. The difficulties experienced have largely concerned themselves with ventilation.

To obtain a movement of air at all adequate for underground bakehouses

the warmer months a fan has been in nearly every instance regarded as necessary. Where electricity is accessible an electric fan is the cheapest and best means of obtaining motive power, at all events so far as the tenant of the bakehouse is concerned.

In two or three cases where electricity was not available a water fan was provided. This has decided advantages from the point of view of the Workshops Inspector, but, unfortunately, the price of water is practically prohibitive.

Gas can be utilised in various ways, but the cheapest and best is to use a gas flame for direct induction.

It is, however, necessary to use at least 10 cubic feet of gas per hour to heat an ordinary flue sufficiently to produce the requisite heat.

Inasmuch as no certificates were granted during 1903, the further proceedings of the Shop Hours Sub-Committee up to the end of May, 1904, are herewith given, as well as the number of bakehouses neither certified nor closed up to the present time :—

Plans and Specifications prepared in the City Surveyor's Department	17
Alterations completed and accepted	9
Sent in by Architects	49
Accepted unconditionally	43
Accepted conditionally	6
Alterations as per Architects plans completed and accepted	13
Certificates granted	22
Bakehouses still working, no plans sent in	10
Bakehouses still working, bakehouses provided, built or building, to replace existing cellars	86
Plans accepted, certificates not yet granted	36
Total underground bakehouses remaining uncertified at end of May, 1904	54

From the early part of October, Inspectors Bailey and Rowe have been almost exclusively occupied with superintending bakehouse renovations. Up to this period no direct supervision was exercised by the Corporation over the progress of work. The Inspectors have done very useful work in this connection.

The action taken up to this time in respect of underground bakehouses is set forth in the following tables :—

Bakehouses Closed during the Year 1903.

Address	Address
49, Clayton Street, Hulme.	*89, Stretford Road.
51, Clarendon Street, Hulme.	91, Warwick Street.
86, Chester Street, Hulme.	*4, Milton Street.
*83, Derby Street, Hulme.	*83, Stockport Road.
*53, Lower Moss Lane.	*170, Brunswick Street.
12, Lever Street.	*263, Ashton Old Road.
*97, Moss Lane West.	489, Mill Street.
*90, Mosley Street.	*310, Oldham Road.
*58, Renshaw Street.	*77, Piccadilly.
*361, Stretford Road.	*212, Rochdale Road.
*194, Stretford Road.	*14, Birch Street.

* Those marked thus (*) were underground, the rest on ground level.

The following table shows the amount of work done since the commencement of operations in 1894 :—

Year	Bakehouses Altered	Bakehouses Closed
1894	3	3
1895	16	12
1896	28	19
1897	22	31
1898	18	17
1899	12	18
1900	8	13
1901	3	17
1902	0	19
1903	2	16
	112	165
	Total, 277.	

The alterations here mentioned have been in all cases considerable, and are, for the most part, carried out according to careful specifications drawn up in the City Surveyor's Department to comply with the requirements of

the Medical Officer of Health. They have not, however, up to 1903, been such as would justify the Corporation in certifying that the bakehouses are in all respects suitable.

It will be noted that 16 underground bakehouses were closed in 1903, and 2 were altered.

Altogether, since 1894, 112 have been altered and 165 have been closed.

The new bakehouses erected during the year 1903 are as follows :—

Statement of the number of Bakehouses approved by the Improvement and Buildings Committee, and completed during the year 1903.

Situation	Date of Approval and Owner	Date of Completion
Addition to Bakehouse, 24, Bury New Road	9th May, 1901—A. Silverstone	7th January, 1903
Addition to Bakehouse, 4, Scotland, Red Bank	10th September, 1902—Kapkevitch	11th February, 1903
Conversion of Work-rooms to Bakehouse, John Street, Cheetham	14th January, 1903—A. Hyman	14th October, 1903
Bakehouse, Clayton Street, Chorlton Road	27th January, 1903—P. Rowlands	15th September, 1903
Bakehouse, rear of 520, Oldham Road and Kay's Yard	22nd April, 1903—J. & T. Shepherd	14th July, 1903

HOUSING OF THE WORKING CLASSES.

The following statement shows the number of new houses certified as fit for human habitation in successive years in the various divisions of the City between 1890 and 1903. It will be seen that the erection of new dwellings was at a maximum in 1896-97, from which year it gradually declined up to 1901, when there was a decided drop. In 1902 there was a very slight increase on 1901, but last year there was again a diminution, and the number of new dwellings reached the lowest point attained since 1894. The various districts, naturally, show no general concordance in the number of new dwellings erected. There is evident, however, a tendency to expansion to the North of the City in the adjoining districts of Cheetham, Crumpsall, Blackley, Harpurhey, and Moston.

A.—Statement as to the Number of Dwelling-houses Certified as Fit for Human Habitation in the various Divisions of the City between 1890 and 1903.

District	1st Nov., 1890, to 31st Oct., 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	1900 to 1901	1901 to 1902	1902 to 1903	Totals
Ancoats ...	31	195	54	70	7	97	113	53	25	28	33	1	4 including 1 Lodging house	711
Central ...	Note:—193 Artisans Dwellings	...	...	...	...	...	...	...	...	...	...	5	1	199
St. George's														
Cheetham	8	38	76	97	37	155	269	370	315	128	253	171	199	2116
Crumpsall	17	7	18	24	44	39	37	41	18	102	53	56	82	538
Blackley ...	29	11	13	5	19	41	31	56	67	58	33	42	57	462
Harpurhey	55	60	60	170	191	342	253	346	327	169	129	70	92	2264
Moston ...	22	12	74	89	148	193	225	263	248	282	179	78	109	1922
Newton ...	40	20	10	30	65	140	96	136	134	110	90	211	167	1249
Bradford ...	36	39	49	21	65	67	198	91	103	198	47	239	29	1182
Beswick ...	2	8	15	8	...	97	118	128	98	119	175	94	...	862
Clayton ...	6	61	6	9	39	111	152	161	229	234	164	104	107	1383
Ardwick ...	4	34	25	59	177	261	192	295	361	145	110	109	171	1943
Openshaw	177	169	65	15	60	69	71	152	119	182	80	190	145	1494
Gorton ...	178	110	30	2	2	20	87	236	178	57	...	...	...	900
Rusholme and Kirk.	51	37	76	89	211	277	294	354	486	462	288	346	258 / 122	3351
C.-on-M. ...	26	97	97	88	18	36	46	57	1	32	48	27	12	585
Hulme.....	...	2	1	1	...	29	24	4	3	2	4	1	6	77
City Totals	682	1093	669	777	1083	1974	2206	2743	2712	2308	1686	1744	1561	21238

The number of new dwellings erected probably reflects to some extent the prosperity of the City, taking into consideration, however, the tendency for building operations alternately to lag behind and to go ahead of the demand for houses, and taking into account also the increasing tendency for new dwellings to be erected in the outskirts. It will be seen from the subjoined table that the number of new dwellings occupied in adjoining districts shows a diminution in 1903 in comparison with recent previous years, excepting 1902.

B.—New Houses Certified in Outside Districts in 1903.

Districts	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903
Salford	...	254	564	454	613	883	872	1268	885	674	818	733	603
Eccles	141	164	109	100	118	113	165	219	202	215	215	185	244
Stretford	30	43	38	274	356	313	355	340	262	265	320	329	379
Urmston	73	45	42	34	80	102	135	88	43	18	21	24	35
Withington Urban District Council :													
Withington, including Whalley Range	23	31	17	50	70	79	162	171	225	169	59	52	35
Didsbury	31	42	33	26	79	55	45	66	139	66	37	34	43
Burnage...	...	...	26	21	...	1	24	13	1	14	14	59	1
Chorlton-cum-Hardy	81	63	10	37	94	155	182	152	55	191	220	182	247
Moss Side	...	...	...	...	...	...	...	119	35	403	400	314	157
Levenshulme	...	...	...	...	...	...	...	224	290	420	180	236	278
Droylsden	...	...	...	...	...	...	...	126	36	41	43	...	135
Gorton	...	...	...	...	...	...	...	397	411	352	353	187	402
Totals.....	379	632	839	996	1410	1701	1940	3183	2584	2828	2680	2335	2559

The following table shows the total operations of the Unhealthy Dwellings Sub Committee since its inception in 1885 :—

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS WITHIN THE CITY, FROM FEBRUARY, 1885, TO DECEMBER 31ST, 1902, ALSO FOR 1903.

SANITARY DISTRICT		Number of Houses Closed, Demolished, or added together or to other houses		Number of Houses Closed, which have not up to the present time been allowed to be re-opened		Number of Houses Closed, which have been subsequently demolished		Number of Houses Closed, and subsequently added together or to other Houses, thereby being discontinued as separate habitation	
		February, 1885, to Dec. 31st, 1902	1903	February, 1885, to Dec. 31st, 1902	1903	February, 1885, to Dec. 31st, 1902	1903	February, 1885, to Dec. 31st, 1902	1903
	1	354	...	84	...	155	...	115	...
	2	546	27	84	7	367	12	95	8
	3	685	7	122	6	272	1	291	...
	4	15	2	5	1	10	...	...	1
	5	4	...	1	...	1	...	2	...
	6	659	5	138	5	302	..	219	...
	7	226	14	49	1	135	11	42	2
	8	33	11	11	7	2	1	24	3
	9	675	39	56	17	391	14	224	8
	10	505	43	16	24	310	9	179	10
	11	367	47	11	28	217	17	139	2
	12	202	21	46	18	49	3	107	...
	13	20	...	6	...	4	...	10	...
	14	404	...	78	...	231	...	95	...
	15	303	10	34	9	177	1	92	...
	16	17	...	1	...	10	...	6	...
	17	194	1	21	1	111	...	62	...
	18	587	...	102	...	321	...	164	...
	19	...	14	...	...	...	2	...	12
Blackley.....	20	6	...	6	...	...	...	...	...
Harpurhey...	20	7	8	...	...	5	8	2	...
	21	...	...	...	...	...	...	...	...
	22	168	2	16	2	70	...	82	...
	23	27	...	6	...	7	...	14	...
Beswick	24	6	...	...	...	2	...	4	...
Bradford	24	24	...	...	...	11	...	13	...
	25	...	...	...	...	...	...	...	...
	26	35	...	17	...	7	...	11	...
Ardwick.....	27	...	...	...	...	...	...	...	...
West Gorton	27	16	...	2	...	8	..	6	...
	28	73	1	4	1	25	...	44	...
Totals	.....	6158	252	916	127	3200	79	2042	46

In the following table is seen the rate at which Insanitary Dwellings have been closed since 1885. This was greatest in the years 1892 to 1896. If it has since slackened, this is owing not to any lack of Insanitary Dwellings, but to fear of producing overcrowding, and to difficulties which have arisen :—

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS WITHIN THE CITY IN EACH YEAR FROM FEBRUARY, 1885, TO DECEMBER 31ST, 1903 (JANUARY TO DECEMBER IN EACH YEAR).

	1885 (From February)	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	Totals.
Number of Houses Closed, Demolished, or added to other houses	56	103	117	191	282	165	287	564	507	782	707	507	284	301	647	255	57	346	252	6410
Number of Houses Closed, which have not up to the present time been allowed to be re-opened	...	4	12	16	39	16	38	56	108	57	61	49	31	50	199	86	10	84	127	1043
Number of Houses Closed, which have been subsequently demolished	46	69	54	112	170	70	116	279	195	511	415	296	185	152	278	100	37	115	79	3279
Number of Houses Closed, and subsequently added together or to other houses, thereby being discontinued as separate habitations ...	10	30	51	63	73	79	133	229	204	214	231	162	68	99	170	69	10	147	46	2088

The housing question is one of great complexity, and it is not proposed to enter fully into it in this report. There appears no sufficient reason for altering the position previously taken up that the chief factor by which the housing conditions can be improved is the provision of cheap facilities for travel from the centre. If by this means the more prosperous classes of artizans can be induced to live further out in newer and better houses, a great alteration for the better will be effected. The pressure in the centre of the City will be relaxed, and there need not be any increase of overcrowding.

There will still, however, remain the problems of insanitary areas created in the past, and of streets which can scarcely be described as areas, and there will also remain the pressure of social conditions, causing overcrowding, even if there be no great lack of house room.

In addition to the encouragement of cheap and convenient means of transference, there will thus be required the reconstruction of insanitary areas as sanitary improvements and by way of the prevention of disease. It is not a necessity of such changes that they should pay their way directly, or rather, it is not to be expected that they will always do so.

There is in Manchester a strong prejudice in favour of cottages as distinguished from tenements. Unfortunately, it is not possible to house the number which will be displaced by reconstruction of areas in cottages Unless, therefore, means are provided for moving a sufficient number of persons to and from the outskirts at such charges as will induce them to go outwards, areas can only be reconstructed by providing tenements in blocks.

Whether it was due to a growing sense of the value of more air space, or whether it was due to pressure from within, such a movement outwards was very conspicuous during the decennium 1891-1900, and it can scarcely be doubted that, with sufficient assistance in travelling facilities, it could be greatly increased.

It may be that this movement was dependent for its inception on a wave of prosperity, and that it has received a temporary check by the recent depression in trade. But it will no doubt again gather force.

How far, however, it is possible to reconstruct areas without providing block dwellings must greatly depend on the extent to which this movement can be accelerated. If it is felt that the Corporation is not justified in offering such exceptional facilities, then the reconstruction of insanitary areas must be by tenements. This question will force itself more and more on public attention as the business area of the centre extends, and as the Education Authority proceeds to make necessary alterations and additions to the Schools.

The question of overcrowding is always with us, and there has been a growing impression that overcrowding is on the increase in the City. It is possible that such is the case within the last two years, owing to the slackness of work.

When distress prevails, the privation is by some made to fall first on food by others on clothing, by others on house-room. In the case of not a few families it falls on all. At such a time overcrowding increases, even while houses are falling empty.

But the impression that overcrowding is on the increase is not a recent one, and was quite as strong in the years preceding the census as in recent times. Taking the City generally a comparison of the conditions of housing at the Census of 1891 and at the Census of 1901 does not bear out this feeling.

Taking the rough standard of overcrowding that there are more than two persons to a room, the facts are given in Table D further on.

There is thus manifest a marked improvement as regards this condition in the City taken as a whole between 1891 and 1901.

The conditions of housing in Lancashire generally are shown by the Registrar-General to have undergone marked improvement during this intercensal period, and the improvement is greater than appears on the surface, owing to the action of improved building bye-laws.

Nevertheless, the tendency to overcrowding is one which requires to be closely watched, and dealt with by the Sanitary Authority unceasingly, yet with discrimination.

Where overcrowding is due to increase in the number of children, all young, it is often impossible to take proceedings for its abatement; where on the other hand, the circumstances of the family, properly used, will permit of sufficient accommodation, the Public Health Act should be enforced.

It is clear that the Officer, on whose reports proceedings are to be taken, should possess exceptional acumen and tact. But it is equally clear that without decided action in respect of overcrowding it is not much use providing sanitary dwellings.

Overcrowding is not the worst feature of housing in Manchester. This will be at once seen on comparing the number of one-roomed, two-roomed, three-roomed, and four-roomed tenements in London, Manchester, Liverpool, and Glasgow. It may be taken generally that the higher the proportion of tenements with one and two rooms the higher will be the proportion of overcrowding.

The following are the facts as supplied by the Census Publications :—

District	Rooms in Tenement	Tenements of less than Five Rooms	Persons per Tenement in the top line; Number of Tenements having that number underneath.											
			1	2	3	4	5	6	7	8	9	10	11	12 or more
London	1	149,524	60,421	48,341	23,680	11,279	4,001	1,257	384	103	39	10	3	6
Liverpool	1	8,527	2,587	3,181	1,675	782	226	57	15	2	1	...	...	1
Glasgow	1	42,623	8,603	12,029	8,683	6,319	3,907	1,850	806	292	91	28	12	3
Manchester 1901	1	**2,140**	**820**	**870**	**318**	**87**	**28**	**10**	**2**	**1**	**3**	...	...	**1**
,, 1891	1	1,604	497	620	252	109	65	23	16	12	7	2	1	...
London	2	201,431	16,148	52,369	46,782	35,828	23,885	14,508	7,283	3,055	1,118	328	101	26
Liverpool	2	11,935	1,196	2,903	2,730	2,294	1,570	737	326	131	39	5	2	2
Glasgow	2	71,207	1,803	8,795	11,431	12,015	1,221	9,543	7,288	4,723	2,589	1,172	424	203
Manchester 1901	2	**6,869**	**871**	**1,884**	**1,591**	**1,197**	**771**	**331**	**148**	**56**	**9**	**9**	**2**	...
,, 1891	2	10,057	941	2,581	2,190	1,839	1,215	750	351	134	45	10	...	1
London	3	181,542	6,288	35,070	39,252	32,954	25,392	18,607	12,026	6,820	3,269	1,251	410	203
Liverpool	3	13,010	334	1,605	2,199	2,369	2,397	1,870	1,188	629	286	89	28	16
Glasgow	3	27,017	450	2,761	3,779	4,094	4,042	3,663	2,996	2,186	1,464	846	442	294
Manchester 1901	3	**4,994**	**192**	**871**	**997**	**933**	**774**	**576**	**359**	**174**	**82**	**22**	**7**	**7**
,, 1891	3	5,356	208	901	990	934	791	664	432	264	111	41	17	3
London	4	139,533	2,252	15,360	22,905	24,839	22,824	18,424	13,871	9,330	5,371	2,733	1,110	514
Liverpool	4	27,433	491	3,917	5,136	5,065	4,337	3,495	2,376	1,440	715	295	115	51
Glasgow	4	9,971	184	1,158	1,460	1,591	1,536	1,276	1,011	691	501	281	148	134
Manchester 1901	4	**47,569**	**938**	**6,787**	**8,939**	**9,083**	**7,542**	**5,885**	**3,877**	**2,429**	**1,231**	**574**	**185**	**99**
,, 1891	4	40,446	713	5,603	7,090	7,274	6,525	5,299	3,659	2,371	1,130	525	175	82

District	Total Tenements	Tenements of less than Five Rooms	Persons per Tenement. 1	2	3	4	5	6	7	8	9	10	11	12 and upwards
London	1,019,546	672,030	85,109	151,140	132,619	104,900	76,102	52,796	33,564	19,308	9,797	4,322	1,624	749
Liverpool	138,845	60,905	4,608	11,606	11,740	10,510	8,530	6,159	3,905	2,202	1,041	389	145	70
Glasgow	163,258	150,818	11,040	24,743	25,353	24,019	20,706	16,332	12,101	7,892	4,645	2,327	1,026	634
Manchester 1901 ...	**112,854**	**61,572**	**2,821**	**10,412**	**11,845**	**11,300**	**9,115**	**6,802**	**4,386**	**2,660**	**1,325**	**605**	**194**	**107**
„ 1891 ...	103,720	57,463	2,359	9,705	10,522	10,156	8,596	6,736	4,458	2,781	1,293	578	193	86

C.

PERCENTAGE OF TOTAL TENEMENTS HAVING 1, 2, 3, 4, 5 AND UPWARDS, ROOMS AT THE CENSUS OF 1901 IN LONDON, LIVERPOOL, GLASGOW, AND MANCHESTER, AND IN MANCHESTER AT THE CENSUS 1891.

	1	2	3	4	5
Manchester 1891	1·55	9·70	5·16	39·00	44·60
Manchester 1901	**1·90**	**6·09**	**4·43**	**42·15**	**45·44**
Liverpool „	6·14	8·60	9·37	19·76	56·14
London „	14·67	19·76	17·81	13·69	34·08
Glasgow „	26·11	43·62	16·55	6·11	7·62

These figures show that Manchester has a much smaller percentage of tenements under four rooms than Glasgow, London, or Liverpool. The proportion of one-roomed and two-roomed tenements in Glasgow is remarkably high, and the proportion of tenements having over five rooms is remarkably low.

From Table D, given below, it will be seen that the proportion of overcrowded tenements of each size is decidedly smaller in Manchester than in London or Glasgow, while it is smaller than in Liverpool except for four-roomed tenements, and that the proportion of all tenements of four rooms and under overcrowded in Manchester is strikingly small compared with these other large towns.

It will be noted also that both in respect of the size of dwellings and of the degree of overcrowding in the smaller houses a very great improvement took place in the City of Manchester between the Census of 1891 and the Census of 1901. It is, therefore, somewhat notable, considering the extent of the alterations in the other towns, that overcrowding should have been so strongly urged in Manchester in relation to the action taken in respect of insanitary dwellings.

The actual proportion of dwellings in these towns overcrowded on the estimate of over two persons per room at the Census of 1901 is herewith given :—

TABLE D.—PERCENTAGE OF TENEMENTS OVERCROWDED, FOUR ROOMS AND UNDER, AT THE CENSUS 1901.

	1	2	3	4	All Tenements up to 4 Rooms inclusive
London	27·26	24·97	13·21	7·16	18·57
Liverpool	32·35	25·24	17·19	4·29	15·08
Glasgow	51·60	52·19	30·46	10·67	45·38
Manchester, 1901	21·03	19·30	13·04	4·39	6·68
„ 1891	30·36	24·92	16·21	4·73	10·05

Yet in spite of these figures as regards housing, London has a considerably lower death-rate and Glasgow has a somewhat lower death-rate than Manchester and Liverpool.

On this, two observations may be made: one is that overcrowding in rooms is by no means the only condition as regards housing which is detrimental to the health of the population.

In Manchester there are several special evils as regards housing. One is that the cottages had formerly no damp-proof course, and that they are therefore necessarily more or less damp in their interiors. Again, over considerable areas—so large in fact that they cannot be overtaken by housing schemes within any definable period of time—the houses have been built too close together, so that there is insufficient ventilation and light at the rear. Add to this that the system of storing excreta has been in middens or pails. In many cases the streets are very narrow. In Ancoats, especially, large numbers of dwellings are under the shadow of lofty buildings.

There are many other conditions, but these are the chief.

Yet the social factors are quite as important as the housing factor in producing the high death-rate of Manchester. The large proportion of licensed houses is an element of the first importance. The high proportion of casual labourers, and of the unemployed, is another factor in the death-rate. The extent of poverty as revealed in the proportion of deaths occurring in the Union Workhouses and in other institutions is terrible in so prosperous a community. The enormous death-rate from Diarrhœa shows that the conditions of the production of children, or of their nurture, or both, are most unsatisfactory.

It is to the elementary schools that we must look for a gradual improvement in the stamina of the rising generation, and in their habits of life. Money judiciously spent on these is certain to be remunerative at short date.

It is impossible to disentangle the effects of bad conditions of housing from those of social conditions generally. Yet, that the latter preponderate may be inferred from the above figures and from the following circumstances.

Following the method pursued by Dr. Herbert Jones, I made in 1895 an investigation into the death-rates for the years 1891-94 occurring in back to back houses and in other dwellings surrounding them occupied by persons not differing very widely in their social position or habits.

It was thus shown that the death-rate was on the average decidedly higher in the back to back houses than in other classes of dwellings, though the difference is not nearly so great as Dr. Chalmers shows to hold between one-apartment and two-apartment houses in Glasgow.

Moreover, in Glasgow the death-rate in two-apartment houses given by him is 21·3 per 1,000, whereas in Manchester the death-rate in two-apartment houses was over 30 per 1,000, and closely approximated to the one-apartment death-rate in Glasgow.

Now there is no doubt that the class of people occupying two-roomed houses in Manchester would be much the same as the class occupying the one-roomed apartments in Glasgow, rather lower in fact, relatively, since the number of two-roomed houses is, relatively to the total, smaller in Manchester than is the number of one-roomed houses in Glasgow relative to the total.

This consideration leaves it open to claim that there would have been a greater disparity between the death-rates of those living in two-roomed houses in Manchester and in one-roomed houses in Glasgow had the proportions of these classes to the totals been more nearly equal.

Substantially, however, we are justified in thinking that a large part of the mortality is, in both cases, due to the wretched social conditions under which the poorest people live in both towns, apart from the conditions as regards housing.

It is, however, certain that the occupation of small houses tends to over-crowding, and that overcrowding is accompanied by depressed vitality and increased mortality.

It is, therefore, of the utmost importance, both by administrative procedure and by public instruction, to foster the desire for ample house-room.

It is often made the subject of complaint that landlords are subjected to great inconvenience and expense owing to the dirty habits of tenants, and it is implied that the Sanitary Authority does not take sufficient action in regard to such conditions.

There is, undoubtedly, ground for dissatisfaction as regards the want of cleanliness in many houses, although I am assured by Mr. Rook that the greatest attention is paid to the remedying of nuisances of this nature.

Although, however, it is certain that poverty and social habits have much to do with the causation of a high death-rate, it does not in the least follow that improvements in housing do not make a very great difference to health.

It can hardly be doubted that privacy and cleanliness in the neighbourhood of houses improve the social outlook, or that a clean, well-lighted, and sufficient dwelling tends to keep the inhabitants at home. The maintenance of such a house imposes obligations and privations, which react beneficially on the people.

There is thus both a direct and an indirect benefit to health from the possession of a sanitary dwelling.

It is true there is a limit to the obligations which can profitably be placed on the householder.

But this limit should include a through current of air, sufficient light, separate and suitable closets, a sufficient supply of fresh air, and cleanliness both inside and outside, both in house and soil.

For these necessities of a healthy life the landlord and the householder may reasonably be expected to find provision.

The improvement of the conditions of housing in Manchester cannot then be regarded as calling for a one-ideaed policy. There is needed not only increased encouragement to live away from the centre, but also the gradual reconstruction of insanitary areas, the closing of isolated insanitary dwellings or groups of dwellings, the suppression of overcrowding, and the removal, as far as practicable, of the numerous conditions in and about dwellings inimical to health.

THE MIDWIVES' ACT, 1902.

A report was presented to the Sanitary Committee in November, 1903, outlining the work which would fall on the Committee under the above Act.

As advised in that report, the requisite notices of the Act have been published, and, so far as possible, have been given to individuals.

A Committee has been recommended to administer the Act, consisting of the Hospitals Sub-Committee, three Co-opted Medical Men and one Medical Woman. A register of Midwives has been formed. The machinery for a systematic enforcement of the Act has yet to be provided.

WORK OF THE LADIES' PUBLIC HEALTH SOCIETY AND THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

The table on page 228 shows the amount of work these Societies have done during the year 1903.

The work performed by these Societies for a number of years in teaching personal and household cleanliness in the poorer districts of the City has had a marked effect in these districts, and an improvement on former conditions can now generally be discerned. The Medical Officer of Health desires to acknowledge the valuable services rendered by the Lady Officers and District Lady Superintendents of the Societies in guiding and aiding the work of the Female Health Visitors.

The Health Visitors have made 20,878 inspections of houses during the year in the course of systematic house-to-house visitation in their respective districts. They have also made 1,687 special enquiries in cases of death,

Work of Female Health Visitors, Year ending 31st December, 1903.

(a) Ladies' Public Health Society.

DISTRICT	Number of Cottages in District	Houses Visited		Condition of Houses							No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	Sickness			Leaflets left at Houses	Disinfecting Powder left at Houses	Limewashing							Reports as to Children being Neglected (clothing, food, &c.)	Help Rendered Help rendered includes :—Giving food, clothing, &c., advising mothers as to care and treatment of children, making of sick beds, cleaning houses for sick persons, obtaining recommends for Convalescents, &c.	Death Cards	Average Death-rate
		First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded			Infectious	Non-Infectious	Total Sickness			Living and Bed Rooms	Kitchens	Yards	Closets	Cellars	Coal-places	Ceilings	Staircases				
1. Ancoats, West	1434	...	551	22	529	517	34	161	390	5	70	53	6	137	143	541	547	104	37	66	66	11	6	105	15	...	54	133	42·0
2. Ancoats, North	2137	...	1325	29	1296	1249	76	109	1216	...	243	21	9	125	134	1257	1323	51	41	60	59	8	16	94	19	6	41	121	30·7
3. Ancoats, Central	1021	...	1143	25	1118	1088	55	287	856	3	25	21	38	276	314	912	1102	132	120	131	131	28	18	124	26	4	215	69	39·2
4. Ancoats, South	1398	...	1245	40	1205	800	445	284	961	12	128	50	11	247	258	1342	1242	81	176	215	216	28	122	73	33	46	162	126	32·7
5. Ancoats, East	1166	...	1327	64	1263	1096	231	298	1029	3	254	57	30	235	265	1431	1327	54	58	85	83	2	33	91	34	5	191	67	29·2
6. London Road	1820	...	1401	130	1271	1255	146	614	787	2	175	56	25	283	308	2190	1225	297	137	318	321	48	43	249	29	4	87	119	34·0
7. Deansgate	1705	...	1267	9	1258	913	354	335	932	14	296	71	10	316	326	1343	986	131	91	103	104	20	59	95	42	7	169	76	35·3
8. St. George's, North	3052	...	870	3	867	853	17	172	698	1	138	30	1	47	48	606	848	22	22	21	21	2	1	17	4	3	138	130	26·8
9. St. George's, East	1421	162	1075	24	1213	1183	54	126	949	...	77	35	6	110	116	1241	1233	7	38	13	10	...	...	15	2	...	88	128	25·1
10. St. George's, Central	1422	...	1106	153	953	991	115	117	989	42	246	95	10	144	154	1302	989	214	41	58	48	6	...	246	91	46	84	72	39·2
11. Angel Meadow	1023	97	1252	2	1347	1250	99	332	920	9	598	44	2	108	110	1451	1325	80	6	21	9	...	...	117	8	1	69	48	50·9
12. Chorlton-upon-Medlock, North	1808	...	1265	3	1262	1234	31	388	877	...	174	21	15	150	165	1634	1137	99	88	136	138	15	10	122	20	...	264	120	32·9
13. Chorlton-upon-Medlock, South	893	...	1130	5	1125	946	184	447	683	2	201	41	7	57	64	1106	996	114	112	128	127	46	3	249	31	13	174	127	25·4
14. Hulme, West	830	617	625	275	967	950	292	90	535	5	218	29	17	224	241	1547	1055	74	58	70	78	14	1	39	22	10	210	72	34·7
15. Hulme, Central	3288	498	207	...	705	680	25	36	171	2	241	19	5	103	108	627	472	126	64	112	94	22	...	40	2	4	107	194	28·8
16. Hulme, East	1134	...	1726	103	1623	1247	479	65	1661	3	535	48	46	478	524	1611	748	102	48	89	90	24	1	129	6	66	503	85	34·8
Total	25552	1374	17515	887	18002	16252	2637	3861	13654	103	3619	691	238	3040	3278	20141	16555	1688	1137	1626	1595	274	313	1805	384	215	2556	1687	33·9

(b) Ladies' Society for Visiting the Jewish Poor.

17. Red Bank	657	...	1095	6	1089	1070	25	90	1005	...	127	74	12	123	135	999	999	28	21	5	1	...	...	58	9	...	85	...	17·3
18. Strangeways	394	...	894	35	859	797	97	68	826	...	561	141	11	49	60	1171	894	3	6	17	9	...	...	5	...	...	51	...	18·5
Total	1051	...	1989	41	1948	1867	122	158	1831	...	688	215	23	172	195	2170	1893	31	27	22	10	...	...	63	9	...	136	...	17·9
Grand Total	26603	1374	19504	928	19950	18119	2759	4019	15485	103	4307	906	261	3212	3473	22311	18448	1719	1164	1648	1605	274	313	1868	393	215	2692	1687	...

and have laid 1,009 complaints as to insanitary conditions which they have detected in the course of their daily work.

They have distributed no fewer than 22,311 leaflets on the following matters :—

1. The prevention of diarrhœa.
2. The prevention of consumption.
3. Precautions against measles.
4. Precautions against whooping cough.
5. Suggestions to householders.
6. How infants should be fed, etc.

By the distribution of the leaflets and by personal instruction a system of educational work is constantly going on amongst the poor.

Disinfecting powder has been left at 18,448 houses.

The importance of cleanliness of the houses and person is steadily inculcated.

Limewashing.—The visitors supply brushes, on loan, and give the necessary sanitary dry lime to tenants of houses who will undertake cleansing. During the year they have been enabled to get 8,984 rooms, yards, closets, etc., thoroughly cleansed and limewashed. To this portion of their work the Medical Officer of Health attaches great importance.

In the course of their daily visits they came across 215 cases of neglected children. The parents were warned in many instances, and others were reported to the Society for the Prevention of Cruelty to Children.

Help was rendered to 2,692 families in many ways, such as in food and clothing, advising mothers as to the management of their children, making the beds of sick patients and cleaning their houses, obtaining recommends for Convalescent Homes, and in the summer months arranging to send children into the country for a holiday, and to the Manchester Camps for Poor Children at the Seaside.

During the year they have been engaged in another very important work, viz., supervising the disinfection of houses in cases of consumption, and seeing to their subsequent cleansing, and with some exceptions this work is carried out to my entire satisfaction. At the end of the year they had 353 cases of consumption under observation in their respective districts. It is their

duty to report monthly as to whether the house is clean and free from dust and dirt, and every three months they see that a thorough cleansing of the house takes place, so as to keep down infective material as much as possible, viz., the walls are rubbed down with dough, the floors and furniture washed, and the bed clothing and personal clothing of the patient washed in boiling water.

I attach, also, very great importance to the work which the Health Visitors are doing in the instruction of mothers in the procedures which they must adopt when artificially feeding their children.

MONSALL HOSPITAL.

REPORT BY DR. A. K. GORDON, MEDICAL SUPERINTENDENT.

The appended tables show the general nature of the diseases admitted to Monsall Hospital during the year 1903, and the results of treatment.

The daily average of patients is 32 less than last year; a slight diminution, which is accounted for by the fact that the usual Autumnal rise in the number of cases of Scarlet Fever did not take place this year.

In submitting the statistics contained in the tables I must point out that they are not of much value when taken from one Hospital only; the numbers are far too small, and in consequence it is not possible to draw any inference of importance from them, as circumstances which cannot be recorded in statistical form influence the results to such a large extent. It is not even possible to compare with accuracy the results obtained in the same Hospital from year to year.

This is most marked in the case of statistics which profess to show the mortality of any particular disease. Half-a-dozen patients dying within twenty-four hours of admission—and these are not really Hospital cases at all—will increase the statistical mortality to a large extent. No doubt the converse happens in the shape of a succession of mild cases, but the effect on the tables is not so marked.

Statistics, therefore, are of value only when taken together with, and not in opposition to, those of other large Hospitals.

In the Hospital generally few structural changes have taken place: a shelter has been erected for the use of visitors to the exterior of the wards on Saturday afternoons, and three open-air shelters for the comfort of the

patients and staff in the grounds. A new residence has been built for the Medical Superintendent.

The fact that the greater part of the Hospital has not been recently built has necessitated the employment of a staff of workmen who are engaged in constant small repairs ; by this means the need for greater and more expensive alterations has been averted. Two fresh blocks have been fitted with an efficient heating apparatus, and one of the Diphtheria wards and part of the Enteric block have been remodelled and fitted with impervious floors. I am inclined to lay stress on the necessity for impervious flooring in all buildings where infection exists. The usual wood floors can only be rendered harmless by constant polishing, which is an expensive process, and is, moreover, a severe strain on the physical powers of the female staff.

The subject of painting deserves some notice also. Last year the painting was done by the Corporation's own workmen under the direction of the Town Hall Steward, and the wisdom of this step has now been made manifest, as the work has a more impervious surface, and it has been possible to scrub and clean it in a manner which was not possible with the painting as usually done by contract. Something better than the ordinary decorative painting is a necessity in a Fever Hospital.

The discipline of the Hospital Staff has been excellent, and cases of sickness few. I regret, however, to report that a Nurse and a Wardmaid have died of Enteric Fever contracted in the performance of their duties in the wards.

In the medical press during the last year the question has again been raised of the value of Isolation Hospitals, and even whether Sanitary Authorities are justified in building or continuing to use them, and there are signs that this doubt is not confined to the medical profession.

The general question does not come within my province, but I must call attention to the bearing that the results of this Hospital have on two points that have been raised against the existence of Isolation Hospitals.

One is that they produce disease—that patients are admitted with one complaint and contract one or more illnesses during their residence. If we take the most common super-added infection, namely, Post Scarlatinal Diphtheria, it will be seen on reference to the tables that this year less than one half per cent. of the Scarlet Fever patients contracted Diphtheria.

Another objection is that Hospitals such as this are not worth the money that is spent on them. In this connection it must not be forgotten that whatever the results of the existence of a Hospital may be on the number of notified cases in the neighbourhood—and it is on this that the financial calculations are usually based—there remains an undoubted benefit in the fact that owing to poverty, or the exigencies of a business where the presence of a case of infectious disease may mean a serious loss, a large number of cases cannot be nursed at home without probable financial ruin. In Manchester, the number of cases of this kind is considerable.

Furthermore, there is the fact that without the larger Isolation Hospitals it would not be possible for medical students to obtain that practical knowledge of infectious disease that is so necessary for the welfare of a community. At Monsall the clinical material that the Hospital contains is used for teaching purposes throughout the year.

A further advantage of the Isolation Hospital lies in the fact that during residence many patients obtain a lesson in Hygiene and personal cleanliness that is often much needed.

As each year passes my conviction grows stronger that it is on the efficiency of the nursing staff that the value of an Isolation Hospital must mainly depend. I do not wish to minimise such important matters as the necessity for plenty of air space per patient, and for buildings that can easily be cleaned, but I certainly think that in Isolation Hospitals as a whole sufficient attention is not paid to the training of the Nurses. In so many institutions it is found difficult to obtain or to keep an efficient staff in this respect. The main point is to make it possible, as it is at Monsall, to secure young and energetic women for training, and to keep them, and this cannot be done unless a certificate of training is given at the end of a course which should last two years at least. I am becoming more and more impressed with the value that the granting of such a certificate by the Corporation is to us here. Under Miss Littlewood's supervision a staff of really capable Probationers has been engaged, and they are working with an energy and interest which has had a real effect on the well-being of the patients, and I must express my strong sense not only of Miss Littlewood's skill in the selection of the junior Nurses for training, but also of the value of her influence over that portion of the staff that are more immediately under her control.

Statistical Report for the Year 1903.

Remaining in Hospital January 1st, 1903	451
Patients admitted during 1903	2631
	3082

Discharged.

Cured and Died	2776
Remaining in Hospital December 31st, 1903	306
	3082

Total number of Deaths during 1903	224
Net Mortality	8·5%

Of the deaths, 48 occurred within 48 hours of admission.

Daily Averages.

Patients	356·2
Nurses and Servants	160·0
Officers	7·4
Daily average stay, in days	46·8

Table showing Monthly Distribution of Principal Diseases throughout the Year.

1903	Scarlatina	Diphtheria	Enteric Fever	Erysipelas	Other Diseases	Total	Daily Average Number of Patients in Hospital
January	204	27	14	1	21	267	448·2
February	127	30	14	5	17	193	405·3
March	130	33	25	8	13	209	369·0
April	115	31	22	4	8	180	334·6
May	146	24	11	1	20	202	301·4
June	156	19	21	6	14	216	316·1
July	130	49	22	3	19	223	343·3
August	119	36	19	4	9	187	337·9
September	157	68	8	4	17	254	319·6
October	172	35	31	5	35	278	364·4
November	132	24	31	13	27	227	375·0
December	123	14	37	7	14	195	360·5
Total	1711	390	255	61	214	2631	356·2

Case Mortality for 1893-1903.

Year 1893	9·36	Year 1899	7·11
,, 1894	7·82	,, 1900	6·22
,, 1895	9·73	,, 1901	7·15
,, 1896	10·60	,, 1902	8·80
,, 1897	8·60	,, 1903	8·50
,, 1898	10·70		

Total Average Case of Mortality for the last Eleven Years.

Year	Disease	Mortality per cent.	Year	Disease	Mortality per cent.
1890	Scarlatina	12·2	1890	Enteric fever	16·4
1891	Do.	6·9	1891	Do.	19·1
1892	Do.	9·1	1892	Do.	19·1
1893	Do.	6·9	1893	Do.	18·6
1894	Do.	4·4	1894	Do.	15·9
1895	Do.	7·1	1895	Do.	20·1
1896	Do.	8·5	1896	Do.	19·6
1897	Do.	6·1	1897	Do.	13·3
1898	Do.	6·7	1898	Do.	16·1
1899	Do.	3·6	1899	Do.	12·3
1900	Do.	4·6	1900	Do.	11·8
1901	Do.	4·7	1901	Do.	13·9
1902	Do.	6·1	1902	Do.	10.9
1903	Do.	4·7	1903	Do.	19.2

Table showing Numbers of Various Diseases treated.

Disease	Remaining in Hospital, Jan. 1st, 1903	Admitted to Dec. 31st, 1903	Dismissed, Cured, and Died During 1903	Remaining in Hospital, Dec. 31st, 1903
Scarlatina	379	1711	1877	213
Diphtheria	30	390	391	29
Enteric Fever	38	255	240	53
Erysipelas	1	61	52	10
Puerperal Fever	0	9	9	0
Morbilli	2	4	6	0
Other Diseases	1	201	201	1
Total...	451	2631	2776	306

SCARLET FEVER.

I submit the usual statistical tables dealing with this disease. It will be noted that the number of patients treated is some 300 fewer than last year, while the mortality is 4·7 as against 6·1 per cent. I do not feel that the numbers are sufficiently large to justify me in attributing the lessened mortality to any definite cause; probably it simply means that we have had fewer severe cases admitted to Hospital.

I am constrained, therefore, in speaking of this disease, simply to generalise from my own personal impressions.

During the last year, I have been trying the effect of a curative serum prepared from animals that have been inoculated with not one, as heretofore, but many varieties of streptococci, and I have a strong impression that in it we have a remedy that is of value in the treatment of severe cases of Scarlet Fever. Certainly, since I commenced its use about seven months ago, some cases have recovered, whom I should have judged, from my previous experience, to have been in a hopeless condition.

The treatment of severe cases by immersion in cold baths continues to give good results, which are mainly shown in the increased amount of sleep and the subsidence of delirium.

Increased precautions to ensure cleanliness—in the surgical sense—in the treatment of the throat have been adopted during the past year, the most important of these being the use of rubber gloves by the nurses whilst they are engaged in this work. The risk of conveying infection during the process of treatment is thus greatly lessened, as the gloved hands can be cleansed in a stream of running water before the nurse proceeds to another patient. It is important to recognise that it is seldom that the throats of any two cases of Scarlet Fever contain the same varieties of bacteria, and that in consequence any one case may be clinically infectious to another, though they are ostensibly both suffering from the same disease.

It will be noted that we have an incidence of less than one half per cent. of Post Scarlatinal Diphtheria; this result is very gratifying, and I am inclined to attribute it to two factors: the vigilance of the nurses in removing infective matter and dust from the vicinity of the patients, and the extent to which bacteriological examinations are made as a routine practice. Cases frequently occur in the Scarlet Fever wards with Diphtheria bacilli in their throats, noses, or ears, in whom no symptoms of Diphtheria are present. In them the bacilli are saprophytes, or "lodgers" only, but there can I think be little doubt that when carried to other patients by clothing, hands, or instruments, they may become true parasites, and give rise to Diphtheria, and that occasionally in a virulent form. It is only by extensive bacteriological examination that such cases can be detected and removed from the Scarlet Fever wards.

A minor point is the further lowering of the incidence of discharges from the nose; this, I am inclined to attribute to the increased use of the nasal douche.

The average length of stay in Hospital is slightly less this year, but here again, statistics are apt to be misleading; the "average stay" is, of course, an arithmetical and not a clinical expression, and it certainly does not represent the period spent in Hospital by the average patient. That is about six weeks, four of which are spent in an acute, and two in a convalescent ward.

Scarlatina.

Age of Patients	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent	Admitted	Died	Mortality per cent.
Under one year...	7	...	...	6	1	16·6	13	1	7·6
1 to 2 years...	28	4	14·2	19	3	15·7	47	7	14·8
2 to 3 ,, ...	51	8	15·6	57	6	10·5	108	14	12·9
3 to 4 ,, ...	70	11	15·7	71	3	4·2	141	14	9·9
4 to 5 ,, ...	76	9	11·8	85	10	11·7	161	19	11·8
5 to 10 ,, ...	365	7	1·9	434	13	2·9	799	20	2·5
10 to 15 ,, ...	145	1	0·6	150	3	2·0	295	4	1·3
15 to 20 ,, ...	38	1	2·6	45	...	...	83	1	1·2
20 to 25 ,, ...	18	...	...	17	1	5·8	35	1	2·8
25 to 30 ,, ...	3	...	...	8	...	...	11	...	...
Over 30 ,, ...	5	1	2·0	13	...	...	18	1	5·5
Total	806	42	5·2	905	40	4·4	1711	82	4·7

Thirteen deaths occurred within 48 hours of admission.

Average stay in Hospital .....year 1901...55·8 days.
Do. do. .....year 1902...57·3 days.
Do. do. .....year 1903...53·8 days.

Average stay in Convalescent Ward...year 1902...22·8 days.
Do. do. .....year 1903...23·0 days.
Do. Acute Ward..... ..year 1902...34·5 days.
Do. do. .....year 1903...30·8 days.

Year	No. of Scarlatinal Fever Discharges	No. of Cases of Post Scarlatinal Diphtheria	Percentage	Died
1901	2669	104	3·8	3
1902	2018	29	1·4	1
1903	1877	8	0·4	2

Percentage Complications in Scarlet Fever, 1903.

Complication	No.	Percentage
Otorrhœa	394	20·9
Rhinorrhœa	164	8·7
Nephritis	107	5·7
Albuminuria	19	1·0
Endocarditis	32	1·7
Adenitis	94	5·0
Synovitis	4	0·02

DIPHTHERIA.

The death-rate of Diphtheria this year was 18·4 per cent. as against 28 per cent. last year. This, while not so phenomenal a mortality, is still much too high, and demands an inquiry into its cause.

The main reason is, undoubtedly, that in a large number of cases patients do not receive antitoxin until the period during which that remedy is of use has passed. In cases of true Diphtheria antitoxin was not given before the patients admission to Hospital, except in about four instances—a number too small to affect the mortality—it was never, this year, thus given in any of the severe cases.

From the annexed tables it will be seen that of all cases the greater number came in on the fourth, fifth, sixth, and seventh days of disease—it is doubtful whether antitoxin is of any use after the third day—and the same ratio occurs in the cases that died. It will be noted that 41, or about 10 per cent., came in after the tenth day. It is, consequently, not surprising that we have such a mortality as was familiar to those of us who were working at Diphtheria before the introduction of antitoxin ten years ago. From the last table of the series it will be seen that rather more than a quarter of the cases were notified by the medical men as soon as they saw the patient, but there remains a considerable number of cases where the patients were under observation without treatment by antitoxin before they were notified.

It should be added that in Manchester antitoxin is supplied by the Corporation free of charge to any medical man requiring it, and that this fact has been notified by circular to every practitioner in the City.

The mortality amongst cases requiring Tracheotomy is again very high—52·5 per cent.. Of these cases 12, or 30 per cent., died within 48 hours of admission. Here another consequence of the neglect of antitoxin is apparent. Everyone of the deaths occurred in cases where the larynx had been affected secondarily to the fauces. All the cases of primary laryngeal Diphtheria recovered. From the voluminous and careful statistics that were drawn up by various institutions during the first five years after the introduction of antitoxin, it is apparent that when antitoxin is given early extension of the disease to the larynx seldom occurs.

In all but about five cases the Tracheotomy was performed immediately after the admission of the patient.

BACTERIOLOGICAL EXAMINATIONS.

At this Hospital over 5,000 bacteriological examinations were made for the Diphtheria bacillus by the medical staff after the admission of the patient. In many cases a specimen was also sent to Professor Delépine, and the agreement between our respective results was very close. The results of the work in the Hospital Laboratory were of incalculable value in the treatment of patients in the wards, in fact it would be impossible to do without them.

All patients with Diphtheria, and all those suffering from Scarlet Fever who had at any time a discharge from the nose or ears, were examined for Diphtheria bacilli before being discharged from the Hospital.

TABLE 1.—DIPHTHERIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.
Under 1 year ...	7	2	28·5	1	...	...	8	2	25·0
1 to 2 years ...	14	7	50·0	13	5	38·4	27	12	44·4
2 ,, 3 ,, ...	16	4	25·0	15	4	26·6	31	8	25·8
3 ,, 4 ,, ...	21	5	23·8	26	9	34·6	47	14	29·7
4 ,, 5 ,, ...	19	5	26·3	19	6	31·5	38	11	28·9
5 ,, 10 ,, ...	56	8	14·2	90	14	15·5	146	22	15·0
10 ,, 15 ,, ...	28	1	3·5	26	1	3·8	54	2	3·7
15 ,, 20 ,, ...	4	...	...	8	...	...	12	...	...
20 ,, 25 ,, ...	3	...	...	7	...	...	10	...	...
25 ,, 30 ,, ...	3	1	33·3	2	...	...	5	1	20·0
Over 30 ,, ...	1	...	...	11	...	...	12	...	...
Total	172	33	19·1	218	39	17·8	390	72	18·4

Twenty deaths occurred within 48 hours of admission.

TABLE 2.—TRACHEOTOMY CASES.

AGE OF PATIENTS	NO. OF PATIENTS	DIED.	MORTALITY PER CENT.
Under 1 year	...	...	...
1 to 2 years	10	8	80·0
2 ,, 3 ,, ...	4	4	100·0
3 ,, 4 ,, ...	11	3	27·2
4 ,, 5 ,, ...	7	4	55·5
5 ,, 10 ,, ...	8	2	25·0
10 ,, 15 ,, ...	...	...	...
15 ,, 20 ,, ...	...	...	...
Total	40	21	52·5

Of these, 12 died within 48 hours of admission.

Average stay in Hospital, in days, year 1901, 31·8
Do. do. ,, 1902, 50·7
Do. do. ,, 1903, 34·1

Table 3.—Complications of Diphtheria.

Complication	Number of Cases	Percentage
Otorrhœa	27	6·9
Rhinitis	14	3·5
All forms of Paralysis	79	20·2
Cardiac Paralysis	21	5·3
Ocular Muscles alone	20	5·1
Pharynx alone	...	...
Palate alone	33	8·4
Diaphragm alone	5	1·2
Laryngeal alone	...	...
Hæmorrhage	11	2·8
Adenitis of Convalescence	3	0·7

Diphtheria Bacilli.*

Age of Patients	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent
Under 1 year	...	...	...	...	...	...	...	...	...
1 to 2 years	1	...	...	1	...	...	2	...	...
2 to 3 ,,	...	...	...	1	...	...	1	...	...
3 to 4 ,,	1	...	...	...	...	...	1	..	...
4 to 5 ,,	1	...	...	...	...	...	1	...	...
5 to 10 ,,	1	...	...	5	...	...	6	...	...
10 to 15 ,,	1	...	...	1	...	...	2	...	...
15 to 20 ,,	...	...	...	...	...	...	...	...	...
20 to 25 ,,	...	...	...	...	...	...	...	...	...
25 to 30 ,,	...	...	...	...	...	...	...	...	...
Over 30 years	...	...	...	1	...	...	1	...	...
Total	5	...	...	9	...	...	14	...	...

*This table shows cases that were suffering from a nasal discharge containing Diphtheria Bacilli, but which had no signs of Diphtheria clinically.

TABLE SHOWING DAY OF DISEASE ON ADMISSION (ALL CASES).

Day of Disease on Admission	No.
1st Day	...
2nd ,, ...	12
3rd ,, ...	41
4th ,, ...	64
5th ,, ...	58
6th ,, ...	49
7th ,, ...	58
8th ,, ...	39
9th ,, ...	19
10th ,, ...	10
Over 10 Days	41
Total	391

TABLE SHOWING DAY OF DISEASE ON ADMISSION (DEATHS ONLY).

Day of Disease on Admission	No.
1st Day	...
2nd ,, ...	2
3rd ,, ...	4
4th ,, ...	11
5th ,, ...	10
6th ,, ...	8
7th ,, ...	14
8th ,, ...	12
9th ,, ...	1
10th ,, ...	2
Over 10 Days	8
Total	72

TABLE SHOWING INTERVAL ELAPSING BETWEEN DATE WHEN PATIENT WAS FIRST SEEN BY A MEDICAL MAN, AND THE DATE OF ADMISSION TO HOSPITAL.

	All Cases	Deaths
Sent in on same day	104	15
2nd day	111	13
3rd ,,	80	18
4th ,,	32	11
5th ,,	21	7
6th ,,	10	3
7th ,,	16	3
8th ,,	4	...
9th ,,	3	1
10th ,,	...	1
Over 10 days	10	...
	391	72

ENTERIC FEVER.

This year the number of cases of Enteric Fever treated is slightly greater, while the mortality is much higher, being 19·2 per cent., as against 10·9 per cent. last year. No less than six deaths, or 12 per cent. of the total, however, occurred within 48 hours of admission, and can scarcely be regarded as belonging to the Hospital; in fact, this year it has become more than usually evident that a certain number of patients have been treated—usually without trained nursing—at home till a late period of the disease and then sent into Hospital, when the fact that death was impending was obvious.

That the increased death-rate is not a Hospital phenomenon is shown by the fact that the incidence of the serious complications has diminished this year. The perforation rate, 2 per cent., in particular is very low.

Of the five cases in which perforation of the bowel occurred Laparotomy was performed in four, and in three the aperture in the bowel was found and sewn up. None recovered, but in one case the patient lived for ten days, and at the autopsy the original perforation was found to have healed soundly, death being due to the subsequent rupture of a suppurating mesenteric gland.

The practice at this Hospital generally in the treatment of Enteric Fever may be summed up in three points: the avoidance of Diarrhœa by varying the feeding,—and in my experience the characteristic Diarrhœa is often due to the inability of the patient to digest milk,—the employment of cold baths,

and the avoidance of alcohol wherever possible, and of so-called intestinal antiseptics altogether.

However, whatever may be said about the medical or surgical treatment of this disease, the fact remains that it is on the skill and patience of the nursing that the result very largely depends.

Enteric Fever.

Age of Patients	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent
Under one year...	...	...	...	...	...	...	...	...	...
1 to 2 years...	...	...	...	1	...	...	1	...	...
2 to 3 ,, ...	2	...	...	...	...	...	2	...	...
3 to 4 ,, ...	4	1	25·0	2	...	...	6	1	16·6
4 to 5 ,, ...	3	...	...	2	...	...	5	...	...
5 to 10 ,, ...	19	1	5·2	10	1	10·0	29	2	6·8
10 to 15 ,, ..	18	6	33·3	8	1	12·5	26	7	26·9
15 to 20 ,, ...	19	3	15·7	10	1	10·0	29	4	13·7
20 to 25 ,, ...	28	9	32·1	14	6	42·8	42	15	35·7
25 to 30 ,, ...	31	7	22·5	19	3	21·0	50	10	20·0
30 to 35 ,, ...	14	3	21·4	10	...	...	24	3	12·5
35 to 40 ,, ...	9	1	11·1	6	...	...	15	1	6·6
40 to 45 ,, ...	8	...	...	1	1	100·0	9	1	11·1
45 to 50 ,, ...	3	1	33·3	8	3	37·5	11	4	36·3
Over 50 ,, ...	4	1	25·0	2	...	...	6	1	16·6
Total...	162	33	20·3	93	16	17·2	255	49	19·2

Six deaths occurred within 48 hours of admission.

Percentage Complications in Enteric Fever.

Complication	No.	Percentage	Complication	No.	Percentage
Bronchitis	24	9·9	Intestinal Hæmorrhage	29	12·0
Pneumonia ...	5	2·0	Perforation ...	5	2·0
Relapse	11	4·5	Neuritis	...	...

Average stay in days, in Hospital .....year 1901...40·8 days
Do. Do. .....year 1902...47·8 days
Do. Do. ... .year 1903...40·5 days

ERYSIPELAS.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent.
Under 5 years ...	2	...	...	1	...	...	3	...	...
5 to 10 ,, ...	1	...	...	1	...	...	2	...	...
10 to 15 ,, ...	1	...	...	1	...	...	2	...	...
15 to 20 ,, ...	1	...	...	8	...	...	9	...	...
20 to 25 ,, ...	2	...	...	3	...	...	5	...	...
25 to 30 ,, ...	1	...	...	4	1	25·0	5	1	20·0
30 to 35 ,, ...	5	1	20·0	1	...	...	6	1	16·6
35 to 40 ,, ...	1	...	...	1	...	...	2	...	...
40 to 45 ,, ...	6	...	...	4	...	...	10	...	...
45 to 50 ,, ...	3	...	...	3	...	...	6	...	...
Over 50 ,, ...	4	...	...	7	1	14·2	11	1	9·0
Total...	27	1	3·7	34	2	5·8	61	3	4·9

OTHER DISEASES.

Of cases notified as Scarlatina, 119 or 6·9% were found on, or after admission, not to be suffering from that disease—practically the same proportion as last year. In my experience it is not often that Scarlet Fever is confused with other serious diseases, by far the more common mistake being in connection with accidental rashes associated with Dyspepsia, Teething, etc. Of the number of cases in which the reverse mistake is made we can have no record.

The method that is adopted for the isolation of these cases is as follows:— The patient is examined in the ambulance before he comes in contact with other patients at all, and if he has not well-marked signs of the disease certified, he is isolated in a small ward until definite signs of the disease become manifest. If no signs appear at all, he is kept in an isolation ward until he leaves the Hospital. In all cases he is detained until it is possible to say definitely that he has not had the disease certified. Meanwhile the certifying medical man is written to, in order that we may obtain a more valuable history of the illness than can be got from the patient or his relatives. I have never heard of infection proceeding after the patients' discharge, from cases so treated, and at Monsall it is not common for patients who have not those diseases to contract Scarlet Fever or Diphtheria after admission.

In Diphtheria the error amounts to 7% and in Enteric Fever to 9%. In no case was the diagnosis of the actual disease in Hospital made solely on bacteriological evidence. It is obvious that the absence of Diphtheria bacilli in a culture from the throat, or of a positive result in the serum test

for Typhoid Fever, is not in itself a proof that the patient has not the disease in question. The diseases notified under the head of Erysipelas have been varied—the term includes for isolation purposes, and I think rightly, not only the cutaneous manifestation of streptococcic infection, but also cases where the organism has affected the cellular tissue, joints, glands, and even bones. The name Erysipelas is, in fact, a relic of the days when it was thought to be a specific disease. In these cases the results of prompt, and often extensive, surgical "interference" have been very gratifying. In three cases amputation of a limb was performed at a site where the skin was affected—all did well. There have been very few cases of Puerperal Fever this year—only nine. In all, an operation of one kind or other was necessary on admission. Two died, one within 48 hours of admission.

The distribution of the other diseases is shown in the annexed table :—

OTHER DISEASES.

Certified as	Actual Disease	No.	Certified as	Actual Disease	No.
Scarlatina.....	Tonsillitis	28	Enteric Fever..	Morbilli	1
,, ...	Erythema	37	,, ...	Carbuncle	1
,, ...	No obvious disease	32	,, ...	Neurasthenia...	1
,, ...	Rötheln	3	,, ...	Nephritis and Peritonitis ...	1
,, ...	Readm. for Cervical Abscess	1	,, ...	Enteritis	2
,, ...	Pneumonia ...	2	,, ...	Tuberculosis ...	1
,, ...	Bronchitis	1	,, ...	Appendicitis ...	1
,, ...	Morbilli	3	,, ...	Vermicalares ...	1
,, ...	Rhinitis	3	,, ...	Bronchitis	1
,, ...	Stomatitis	1	,, ...	Gastro-Enteritis	2
,, ...	Broncho-Pneumonia	1	,, ...	Periostitis	1
,, ...	Dermatitis	1	,, ...	Malaria	1
,, ...	Septicœmia ...	2	,, ...	Pericarditis ...	1
,, ...	Enema Rash ...	1	,, ...	Hæmorrhoids...	1
,, ...	Rheumatism ...	1	,, ...	Variola	1
,, ...	Gastric Ulcer...	1	,, ...	Meningitis	1
,, ...	Enteric Fever...	1	,, ...	Influenza	1
Diphtheria ...	Tubercular Meningitis .	1	Morbilli	Rötheln	2
,, ...	Tonsillitis	17	Erysipelas ...	Pityriasis Rubra	1
,, ...	Morbilli	1	,, ...	Lacerated Wound of Scalp	1
,, ...	Laryngitis	2	,, ...	Carbuncle of Lip.....	1
,, ...	Post Pharyngeal Abscess	1	,, ...	Abrasion of Face	1
,, ...	Scarlatina	7	,, ...	Œdema of Legs	1
,, ...	Rhinitis	1	Sent in with Mother ...	.....	3
Enteric Fever..	Pneumonia ...	3			
,, ...	Pleuritis.....	1			

18 deaths, 9 occurred within 48 hours of admission. Total mortality of other diseases 8·4 per cent.

PARTICULARS OF RETURN CASES OF SCARLET FEVER.

No. of alleged originating Cases 101

Do. return Cases *99

Table I.

Showing duration of stay in Hospital in Convalescent Ward.

	Convalescent Ward
Under 14 days	12
14 to 21 „	43
21 to 28 „	13
28 to 35 „	3
Over 28 „	3
Over 35 „	6
Total	80

21 cases were not in a Convalescent Ward at all.

Total stay in Hospital.

	Total Residence
4 to 5 weeks	—
5 to 6 „	5
6 to 7 „	21
7 to 8 „	15
8 to 12 „	43
Over 12 „	17
Total.....	101

Table 2.

Showing Condition of Discharge of Originating Case.

Nothing abnormal on discharge.....	91
Of these nothing abnormal after discharge	61
Otorrhœa subsequently	9
Peeling do.	3
Rhinorrhœa do.	22
Sores on nose or lips subsequently.....	6
	40
Abnormality on discharge.	
Otorrhœa on discharge	3
Peeling do.	0
Rhinorrhœa do.	6
Sores on nose or lips on discharge.....	1
	10

*The number given in the Medical Officer of Health's return is 104. A discrepancy may arise by reckoning as two return cases, two cases occurring after the discharge of a patient, one being, possibly, infected from the other.

TABLE SHOWING INTERVAL BETWEEN THE DISCHARGE ON THE ALLEGED ORIGINATING CASE AND THE INFECTION OF THE SECOND.

Time	No. of Cases
24 hours	...
48 „	1
72 „	1
4 days	6
5 „	7
6 „	7
7 „	3
7 to 14 days	25
2 to 3 weeks	19
3 to 4 „	6
Over 4 „	12
Total	87

Fourteen cases are omitted from this table: they were from the same household as some of the above, and the interval is difficult to estimate.

RETURN CASES.

Before considering in detail those cases of Scarlet Fever, which are alleged to have given rise to other cases after their discharge from Monsall, there are one or two points in the general aspect of this most important question to which I wish to refer. The first is the difficulty of eliminating wilful withholding by the parents of the child originally removed to Hospital of clothes which they fear will be spoilt in the process of disinfection. If this occurs, it is obvious that the clothes which have not been disinfected will very probably be produced about the time that the child returns from Hospital, and the incubation period of the resulting case will be the same as if the original child was itself the source of infection. To obtain accurate information on this point is not possible, but I must record my conviction that this practice does occur.

Secondly, and in the justice of this, I quite agree, in Manchester there is no "time limit" for return cases, such as is arbitrarily fixed in some other Cities. I think it is obvious that a patient, if infectious when discharged from Hospital, may continue to be so, especially if he is badly fed, and in dirty surroundings, for an indefinite period, in fact, for a reason which will appear later, I think it is probable that some cases become more infectious at home than they were when first discharged. But the absence of any time limit must be borne in mind when making comparison with the results of other Cities such as London for instance, where an arbitrary limit (in London it is one month) is imposed.

I have, however, assumed, as formerly, that, in all cases where contact, however remote, has occurred in the case of a patient suffering from Scarlet Fever with a patient discharged even some time back from Monsall, that the original case was infectious when discharged from Hospital. It remains, then, to consider how this has happened.

As I said in my last year's report, I am in complete accord with Dr. Niven's view that a patient with Scarlet Fever, though at first intrinsically infectious, collects also during convalescence infective matter from patients in the acute stage of the disease, and that this infective matter finds a resting place in the nostrils of the convalescent. Acting on this hypothesis, patients at the end of a month from the onset of the illness are bathed, anointed with oil, and removed to a ward in a separate part of the grounds, where they are sent out to play in the open air as much as possible, and their nostrils are douched daily with an antiseptic solution; the bathing and anointing is repeated three times a week. At the end of a further fortnight, if there is no discharge from any mucous membrane, or congestion of the throat, or marked desquamation, the patient is discharged. In the patients with mucous discharges a longer period of treatment in the convalescent ward is given. So an attempt is made in the convalescent ward to rid the patient of the superadded infection which he has received from other patients in the acute ward.

Turning to the figures, it will be seen that 99 patients were infected from 101 discharged from hospital. This apparent discrepancy is due to the fact that frequently two patients are discharged to the same house on the same day. It is then not possible to say which has been the source of the return case. This is a percentage of 5 per cent. of the total number of Scarlet Fever patients discharged from hospital, and is slightly higher than that of last year. It is obvious, therefore, that the treatment is not entirely successful, and we must enquire into the reason for the failure.

In the first place, we have no means of knowing when a patient has ceased to be intrinsically infectious; as long as he is so, he can infect other patients if he is transferred to a convalescent ward. The period of a month is an arbitrary one. Secondly, it is impossible to tell when we have eradicated the extrinsic infectious material from the nostrils, and there the difficulty seems to be great. We are treating a tortuous absorbent cavity with a very weak germicide. Does this either get at all the infection or kill it if it does?

A third point is the difficulty of preventing the storing up of infectious matter in the convalescent wards themselves—they are made of wood and are porous throughout.

They can only be kept clean by constant scrubbing, and the wood is made more porous each time this is done.

My own view is that the treatment does do a large amount of good, and I think there is every reason to believe that, were the patients discharged direct

from the acute wards, the number of return cases would be higher. I believe the reason why it fails in some cases is that the infecting organisms are situated not only on the surface of the mucous membranes of the nose and naso-pharynx, but also in its substance. The solution may, and from experiments of M. H. Gordon, it seems possible that it does, kill these organisms at, and when they come to, the surface, but it has but little penetrating power. Those that are not killed come to the surface after the patient leaves Hospital, and infect others.

This hypothesis, too, seems to me to fit well with the facts as shown in the last table. There it will be seen that it is in the 2nd to 4th week after their discharge that the children have been most infectious—not directly after they leave Hospital. It will be noticed that the large majority of the alleged originating cases were not suffering from any mucous discharge when they left Hospital, but that this appeared, or reappeared subsequently, in half of the patients. It may well be that in some patients where the organisms are not entirely eradicated, infection occurs in the often dirty surroundings of their homes, while with the daily douching, and cleanliness of Hospital life, it either does not occur or is not apparent.

I cannot conclude without expressing my thanks to the Chairman and those members of the Committee who have visited the Hospital, for the many and valuable suggestions that I have received from them in matters pertaining to the affairs of the Hospital or the well-being of the Staff.

A. Knyvett Gordon,
Medical Superintendent.

January, 1904.

REPORT BY MR. A. T. ROOK, SUPERINTENDENT OF THE SANITARY DEPARTMENT.

Sanitary Department,
Town Hall, Manchester.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1903, I beg to state that the City, for inspection and other purposes, is divided into 28 Districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there is a Superintendent, one Chief Inspector, two Drainage, four Smoke, one Canal Boats and Lodging-house, two Adulteration of Food, six Factory and Workshops Inspectors, including two Female Inspectors, and two Drain Examiners.

There is also a staff of 25 Clerks and one Surveyor for clerical and other work.

In the House Drainage Department there are also six Clerks of Works for supervising and measuring up work done by the contractors employed by the department in carrying out private drainage work.

The number of complaints of nuisances of various kinds made during the year was 45,617, viz.:—

22,953	through the Medical Officer of Health's Department.
2,244	by the Public.
158	through the Police.
20,316	by the Staff.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the bye-laws made thereunder have been enforced.

The number of houses on the register is 930.

To these, 2,756 day visits and 246 night visits have been paid.

Fifteen infringements of the regulations have been reported and dealt with.

One visit has also been paid to an unregistered house, the occupier having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, and the Regulations thereunder in 1896, 2,744 milkshops and dairies and 84 cowkeepers are now on the register. The number of cows kept is 1,109. The number of visits to dairies, milkshops, and cowsheds was 2,504. Five cowsheds have been closed as being unfit for use on sanitary grounds.

Many of the cowsheds have been much improved since last year, but there are still a few in an unsatisfactory condition, and steps are being taken to improve these.

WORKSHOPS, BAKEHOUSES, SHOP HOURS, AND SEATS FOR SHOP ASSISTANTS ACTS.

During the year the Acts have been well observed, only a few persons having been reported for infringements.

Shop Hours

As regards the Shop Hours Act, experience still further confirms the opinion previously expressed that in the absence of a declaration specifying the working hours for each day, as in the case of the Factory and Workshop Acts, it is difficult to produce sufficient evidence to justify prosecutions, the evidence of the young persons in nearly every instance, probably through the influence of their employers, or other reasons, contradicting the signed declarations previously made to the Inspectors.

Workshop Acts.

Great improvements have been effected since the last report in the condition of workshops, many alterations having been made—either after notice or at the request of the Inspectors—to improve the ventilation, lighting, overcrowding, cleansing, and general sanitary conditions.

Special attention has also been given to see that premises are provided with sufficient and satisfactory closet accommodation, this being a common defect in a number of the largest workshops.

In nearly all the cases reported the necessary accommodation has been provided, and others are under notice, and will be dealt with in due course.

Means of escape in case of fire.

With regard to means of escape in case of fire, the whole of the factories and workshops in the City have been inspected, and with very few exceptions are now considered safe.

Periodical changes will, of course, from time to time take place in various ways which will bring buildings within the meaning of the Act, and necessitate the constant supervision of the Inspectors, and action on the part of the authorities.

Bakehouses.

During the year several more of the worst bakehouses in the City have been absolutely closed, and a number of others have been reported by the Medical Officer of Health to be unfit for use until satisfactory alterations are made to place the premises in a better sanitary condition.

Extensive alterations have been made in many of the bakehouses, and a general improvement is manifest throughout the City consequent upon the action taken by the department.

Out-workers.

Many visits have been paid to houses in which out-work is carried on, as will be seen on reference to the following tabulated statement, but constant visitation is necessary to maintain the standard of cleanliness which is to be desired, especially in houses in which shirt-making, handkerchief-hemming, brace-making, and umbrella-covering, etc., is done. This class of work is almost exclusively confined to the poorer people, who live in small houses in the congested parts of the City.

The people, as a rule, appear willing to carry out any suggestion made by the Inspectors to keep their houses clean; but at the same time it is almost impossible for small houses, sometimes containing large families, to be kept in such a satisfactory condition as workshops.

Seats for Shop Assistants Act.

This Act, without the necessity of any legal proceedings, has been complied with by all the shopkeepers of the City.

The work done under the above Acts is shown in the following tables.

Showing the Work done by the Inspectors under the Shop Hours, Seats for Shop Assistants, and Factory and Workshop Acts.

Number of District	INSPECTOR	SHOPS — Shop Hours Act					SHOPS — Seats for Shop Assistants Act					WORKSHOPS						OUT-WORKERS		Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES					
		Number of visits	Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number of infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number in which Sanitary Defects were found	Number of Reports referred to H.M. Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits to houses where out-workers are employed	Number of houses found dirty.		Number of visits	Number in which Sanitary defects were found	Number of reports referred to H.M. Inspector of Factories	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
1	StanleyC.Peacock	1	...	...	...	648	...	...	...	...	171	3819	209	145	4	288	1347	2	...	2	447	13	2	...	12	87
2	John Kewley ...	27	5	...	...	1003	...	...	...	...	330	2928	211	93	7	231	1007	97	...	7	967	73	7	...	14	180
3	Ernest Bailey ...	9	...	...	...	514	...	...	...	...	218	2816	225	58	2	138	933	13	2	1	1013	114	1	...	6	142
4	Francis J. Rowe..	3	...	...	1	639	...	...	...	...	278	3428	305	143	3	267	1142	43	1	3	639	21	7	...	5	134
...	Emma Coppock..	1506	96	1	115	...	449	...	...	59	...	2096	252	1	28	...	...	1185	38	...	...	...	...	...	...	...
...	Margt. L. Brown..	1201	94	13	121	...	535	...	...	97	...	1548	128	...	16	...	...	2045	26	...	...	...	...	...	...	...
...	Totals ...	2747	195	14	237	2804	984	...	...	156	997	16635	1330	440	60	924	4429	3385	67	13	3066	221	17	...	37	543

PROSECUTIONS FOR OFFENCES, WITH RESULTS.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed, Withdrawn, &c.
		SHOP HOURS ACT	£ s. d.	£ s. d.	
Mosley Hotel Co., Limited (Seligman & Makay)	Mosley Hotel, Piccadilly	Employing a young person over 74 hours a week	0 10 0	0 9 0	
Ditto	Ditto ...	Ditto ...	0 10 0	0 9 0	
Ditto	Ditto ...	Ditto ...	0 10 0	0 9 0	
Ditto	Ditto ...	Ditto ...	0 10 0	0 9 0	
Albion Hotel, Ltd.	Albion Hotel, Piccadilly.....	Ditto ...	0 1 0	0 2 6	
Amy Hultz	22, Deansgate Arcade	Not exhibiting Abstract of Shop Hours Act in her shop	0 5 0	0 5 0	
Stephen Fielder.....	152, Oxford Street	Ditto ...	.....	0 3 6	Withdrawn
Thomas Hayward...	64, Deansgate	Ditto ...	0 10 6	0 9 0	
Philip Frankenberg.	61, Oxford Street, City	Ditto ...	0 10 6	0 9 0	
George H. Simmons	123, Chester Road	Ditto ...	.....	0 3 6	Ditto
John L. Smith	307, Chester Road	Ditto ...	.....	0 3 6	Ditto
Thomas Ward	172, Brunswick Street	Ditto ...	.....	0 3 6	Ditto
Bennett & Carlysle Limited	239, Deansgate	Ditto ...	.....	0 3 6	Ditto
Joseph Orr & Co....	14, Fountain Street.....	Ditto ...	.....	0 3 6	Ditto
Robert James Cowen	157, Great Ancoats Street	Ditto ...	0 2 6	0 2 6	
Henry Cohen	158, Ashton Old Road	Ditto ...	0 5 0	0 5 0	
Daniel Melia & Co. Limited	76, Stretford Road	Ditto ...	.....	0 6 6	Ditto
		Carried forward .....£	3 14 6	4 16 6	

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed, Withdrawn, &c.
			£ s. d.	£ s. d.	
		Brought forward.....	3 14 6	4 16 6	
	FACTORY AND	WORKSHOP ACT			
John Wainwright ...	27 and 29, Cannon Street	Neglecting to ventilate workshop, 31, Oldham Road, after notice	.....	.....	Withdrawn (work done)
John Fallows.....	67, Piccadilly	Ditto 4, Newton Street ...	.....	.....	Ditto
Jacob Dembovski...	16, Ramsgate Street	Neglecting to fix hood to gas stove in workshop after notice	.....	0 3 6	Ditto
Messrs. Groome and Ramsdale	13, Spring Gardens.....	Neglecting to repair roof of workshop, 290a, Upper Brook Street, after notice	.....	0 3 6	Ditto
Ernest W. Walkden	98, Travis Street.....	Neglecting to repair roof, &c., of workshop, behind 40, Palmerston Street, after notice	.....	.....	Ditto
John Megson	15, Watling Street	Neglecting to partition off closet from workshop, 11, Friday Street, after notice	.....	.....	Ditto
Samuel Lees	11, Oak Street.....	Neglecting to limewash his workshop after notice	.....	.....	Withdrawn (removed)
Clara Fogg.....	31, Higher Cambridge Street...	Neglecting to limewash her house (outworker) after notice	.....	.....	Ditto
James Courtman ...	361, Stretford Road	Neglecting to prevent offensive smells from stable entering workshop, No. 71, Tomlinson Street, after notice	.....	0 9 0	Order of abatement made
		Carried forward .....£	3 14 6	5 12 6	

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed, Withdrawn, &c.
		Brought forward	£ s. d. 3 14 6	£ s. d. 5 12 6	
	FACTORY AND WORKSHOP	ACT—*continued*			
Albert Bianco	30, Bootle Street.....	Neglecting to repair roof and ventilate workshop after notice	.....	0 3 6	Withdrawn (work done)
Albert Alexander ...	91, Market Street	Not forwarding list of outworkers to the Local Authority	0 5 0	0 5 0	
Barnett, Hayhurst, and Co.	3, Friday Street	Ditto ...	.....	.....	Withdrawn
Blackwell & Martin..	53, Piccadilly	Ditto ...	.....	0 3 6	Ditto
Sarah Bennett	278, Queen's Road.....	Ditto ...	0 2 6	0 5 0	
William Faust	55, Cannon Street	Ditto ...	0 2 6	0 2 6	
Dora Goldman	33, New Brown Street	Ditto ...	.....	.....	Ditto
Jos. Hadfield & Co.	22, Turner Street.....	Ditto ...	0 2 6	0 2 6	
Kennedy, Chew, and Thorpe	1, Cathedral Gates	Ditto ...	0 2 6	0 2 6	
Charles Murphy ...	382, Rochdale Road	Ditto ...	0 2 6	0 2 6	
Charles Merritt.....	32, Cannon Street	Ditto ...	0 2 6	0 9 0	
Chyer Moss	36, Bury New Road	Ditto ...	.....	0 3 6	Ditto
William Timpson ...	526, Oldham Road.....	Ditto ...	.....	0 3 6	Ditto
A. Williamson & Co.	10, Watling Street	Ditto ...	0 5 0	0 7 0	
Jno.O'Donnell&Son	7, Palace Street	Ditto ...	0 2 6	0 5 6	
Frank J. Bachelor...	71, Barton Arcade	Ditto ...	0 2 6	0 4 6	
		Carried forward	5 4 6	8 12 6	

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be paid	Dismissed, Withdrawn, &c.
			£ s. d.	£ s. d.	
		Brought forward.....	5 4 6	8 12 6	
	FACTORY AND WORKSHOP	ACT—*continued*			
The Colonial Shirt Manufacturing Company Limited	78, Great Bridgewater Street ...	Not forwarding list of outworkers to the Local Authority	.....	0 3 6	Withdrawn
The Household Stores Association Limited	44, King Street West	Ditto ...	0 2 6	0 5 6	
Hill and Brown.....	46 and 48, Deansgate.....	Ditto ...	0 2 6	0 2 6	
Lilian Jackson	3c, Drake Street, Hulme	Ditto ...	.....	0 3 6	Ditto
Jas. Nicholson & Son Limited	Mosley Street	Ditto ...	.....	0 3 6	Ditto
Ohm and Webster..	2 and 4, Princess Street.....	Ditto ...	0 5 0	0 5 0	
Raeper & Plowman..	78, Mosley Street	Ditto ...	.....	0 3 6	Ditto
William Smith	174, Stretford Road	Ditto ...	0 2 6	0 5 6	
Salter & Salter Ltd.	300, Stretford Road	Ditto ...	0 2 6	0 4 6	
Edwards, Ross & Co.	24a, Church Street	Ditto ...	.....	0 6 0	Ditto
Charles Stott & Co.	38, Mark Lane	Ditto ...	0 2 6	0 4 0	
Robert Spedding and Sons	17, Watling Street	Ditto ...	0 2 6	0 4 0	
Mark Goldman	27, Hanover Street.....	Ditto ...	.....	0 7 0	Ditto
Wm. Henry Birchall	28a, Oak Street	Ditto ...	.....	0 3 6	Ditto
		Carried forward	6 4 6	11 14 0	

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed, Withdrawn, &c.
		Brought forward	£ s. d. 5 4 6	£ s. d. 11 14 0	
	FACTORY AND WORKSHOP	ACT—*continued*			
Theresa Byrne	Hood Street, Ancoats.....	Not forwarding list of outworkers to the Local Authority	.....	0 3 6	Withdrawn
Dunkerley & Franks	7, Swan Street.....	Ditto ...	0 5 0	0 5 0	
Philip Emanuel.....	60, Stocks Street.....	Ditto ...	0 5 0	0 7 6	
Wm. John Gibson...	10, Brewer Street.....	Ditto ...	.....	0 3 6	Ditto
G. and W. Morton...	93, Oldham Street	Ditto ...	.....	0 3 6	Ditto
Jas. Madders & Co.	31, Hilton Street.....	Ditto ...	.....	0 3 6	Ditto
Henry H. Madden...	Great Ancoats Street	Ditto ...	0 5 0	0 7 6	
Louis Ray & Co. ...	20, Oldham Road, M. Platting	Ditto ...	0 10 6	0 11 6	
Cecil Thurlby & Co.	10, Green Street, Tib Street ...	Ditto ...	0 2 6	0 5 0	
Mark H. Fowler and Co.	33, Princess Street	Ditto ...	.....	.....	Ditto
John Lyth	95, Princess Street	Ditto ...	.....	.....	Ditto
Wm. W. Langley ...	52, Stretford Road	Ditto ...	.....	0 3 6	Ditto
R. W. Trenbath and Sons	20, Nicholas Street	Ditto ...	.....	0 3 6	Ditto
		Total	7 12 6	14 11 6	

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 789 timed observations of half-an-hour each, with the result that 167 notices for the abatement of nuisances have been served. Proceedings before the Magistrates have been ordered in 199 cases out of 234 offences reported. These cases were disposed of as follows :—

One hundred and ninety-nine were summoned before the justices, in 132 of which fines were imposed amounting to £278 14s. 0d., and costs £81 19s. 6d. Two were ordered to pay costs only.

Sixty orders of abatement were granted and served, 6 cases were excused, dismissed, or withdrawn. (In one case a fine was imposed in addition to an order of abatement being granted.)

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It may be stated that representations have been made to other Authorities on the North-East and West sides of the City, in regard to the great pollution of the air of the City by the excessive emission of smoke from the chimneys in their districts.

SALE OF FOOD AND DRUGS ACTS AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,832 samples. Of these, 65 were adulterated, viz. :—

Butter	17
Cheese	2
Milk	31
Mustard	1
Spirits	8
Shrimps...	4
Vegetables (tinned or bottled)	2

Fifty-six summonses were issued. In 42 cases fines were imposed amounting in the aggregate to £97 13s. 6d., with costs £64 8s. 6d. Two persons were ordered to pay costs only.

Twelve summonses were dismissed or withdrawn.

Appended are tables showing the result of the action taken under the Acts since 1873.

Showing the number of Articles of Food and Drugs procured for Analysis, the number Adulterated, the number informally purchased or in which no proceedings were taken, and the number of cases in which Magisterial Proceedings were taken, together with the Decisions and the Total Amount of Fines imposed from May 1st, 1873, to April 30th, 1903.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates				
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total Amount of Fines Imposed
								£ s. d.
Arrowroot	6	...	...	...	...	...	...	.....
Bacon	1	...	...	...	...	...	...	.....
Baking Powder	37	...	...	...	...	...	...	.....
Beef Dripping	1	...	...	...	...	...	...	.....
Beer	492	72	34	38	19	...	19	38 0 0
Bread	1105	39	7	32	32	...	...	119 10 0
Butter	2245	365	27	338	268	3	67	475 9 0
Buttermilk	2	2	2	...	...	...	...	.....
Cheese	214	10	4	6	5	...	1	15 0 0
Chicory	43	...	...	...	...	...	...	.....
Cider	3	...	...	...	...	...	...	.....
Cocoa	30	...	...	..	...	...	...	.....
Cod Liver Oil	6	...	...	...	...	...	...	.....
Coffee	556	40	2	38	37	...	1	57 15 6
Confectionery	304	2	...	2	2	...	...	10 0 0
Cream	12	...	...	...	...	...	...	.....
Drugs	406	10	9	1	1	...	...	0 5 0
Fish (tinned)	1	...	...	...	...	...	...	.....
Flour	139	...	...	...	...	...	...	.....
Fruit (tinned)	2	...	...	...	...	...	...	.....
Jams	240	1	...	1	1	...	...	1 0 0
Jelly	2	...	...	...	...	...	...	.....
Ketchup	1	...	...	...	...	...	...	.....
Lard	700	27	5	22	18	...	4	44 3 6
Margarine	108	...	..	...	...	...	...	.....
Meats (tinned) ..	6	...	...	...	...	...	...	.....
Milk	20728	1497	24	1473	1003	..	470	2948 0 6
Milk (skimmed)	149	23	...	23	18	...	5	39 1 6
Milk (condensed)	6	...	...	...	...	...	...	.....
Mineral Waters, &c.	255	79	76	3	...	...	3	.....
Carried forward	27800	2167	190	1977	1404	3	570	3748 5 0

ANALYSIS—*continued.*

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates						
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total Amount of Fines Imposed		
								£	s.	d.
Brought forward	27800	2167	190	1977	1404	3	570	3748	5	0
Mustard..	337	46	6	40	34	..	6	19	4	0
Oatmeal.....	144	...	...	...	...	...	...	.....		
Olive Oil	12	1	...	1	1	...	...	0	2	6
Pepper	609	5	...	5	4	...	1	1	7	6
Pickles	4	...	...	...	...	...	...	.....		
Porter	8	...	...	...	...	...	...	.....		
Rice, Tapioca, &c.....	108	...	...	...	...	...	...	.....		
Shrimps	8	4	4	...	...	...	...	.....		
Spices	240	1	...	1	...	...	1	.....		
Spirits	1151	50	7	43	40	...	3	87	7	0
Sugar.....	65	...	...	...	...	...	...	.....		
Tea	388	...	...	...	...	...	...	.....		
Treacle & Golden Syrup	46	10	7	3	2	...	1	2	0	0
Tripe	1	...	...	...	...	...	...	.....		
Vegetables (tinned) ...	17	9	8	1	...	...	1	.....		
Vinegar.....	127	8	...	8	7	...	1	2	10	6
Wines	35	...	...	...	...	...	...	.....		
Totals.....	31100	2301	222	2079	1492	3	584	3860	16	6

Other Offences against the Acts.

Offence	No. Summoned	No. Fined	No. Dismissed or Withdrawn	Total amount of Fines imposed		
				£	s.	d.
Refusing to serve Inspector with Samples of Food	22	22	...	73	2	6
Giving False Warranty	18	6	12	46	0	0
Obstructing Inspector in the execution of his duty..	1	...	1	.....		
Selling Milk from a vehicle which had not the name and address of the person inscribed thereon	4	4	...	0	10	0
Selling Margarine in an unstamped wrapper.....	1	1	...	0	2	6
Totals.....	46	33	13	£119	15	0

Total amount of Penalties for Adulteration.....	£3,860	16	6
Total amount of Penalties for Other Offences.....	119	15	0
Grand Total.....	£3,980	11	6
Total amount of Penalties against Farmers	£1,841	15	0

Showing the number of persons summoned more than once under the Adulteration of Food and Drugs and Margarine Acts from May 1st, 1873, to April 30th, 1903.

Milk Dealers.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	In County (Salford)
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Milk.	0 5 0 *8 W*	Withdrawn *10 W*	1 0 0 *16 W*	.....	.....
2	Do.	10 0 0 *60 F*	10 0 0 *11½ F*	.....	.....	.....
3	Do	10 0 0 *66 F*	5 0 0 *64 F*	1 0 0 *9½ W*	5 0 0 (*Skimmed Milk*) *8 W*	10 0 0 2 0 0 1 0 0 5 0 0
4	Do.	0 10 0 *6½ W & 5 F*	2 0 0 *9 W*	.....	.....	.....
5	Do.	3 0 0 (Refusing)	10 0 0 *9 W*	5 0 0 *56 F*	.....	.....
6	Do.	2 0 0 *11 W*	2 cases Withdrawn (Farmer fined) *20 F each*	2 0 0 *10 W & 17 F*	5 0 0 *44 F*	.....
7	Do.	2 0 0 *5 W*	Withdrawn *11½ W*	6 0 0 *1½ W & 15 F*	10 0 0 *2 W & 33 F*	.....
8	Do.	3 0 0 *10 W & 25 F*	1 0 0 *5 W*	.....	.....	.....
9	Do.	1 1 0 *24 W*	1 1 0 *30 F*	.....	.....	.....
10	Do.	1 0 0 *10 W*	5 0 0 (Refusing)	15 0 0 *30 W*	.....	.....
11	Do.	2 0 0 (Refusing)	Withdrawn (Farmer fined) *8 F*	2 10 0 *12 W*	5 0 0 *8 W*	.....
12	Do.	2 0 0 *10 W*	Withdrawn (Farmer fined) *7 W*	2 0 0 *5 W*	.....	.....
13	Do.	1 0 0 *40 F*	1 0 0 *7 W*	5 0 0 (Refusing)	.....	.....
14	Do	1 1 0 *8½ W*	5 0 0 *14 W*	2 0 0 *12 W*	1 10 0 *8 W*	2 0 0 20 0 0
15	Do	10 0 0 *20 W*	5 0 0 *13 W*	5 0 0 *10 W*	.....	.....

The figures in *Italic* denote the percentage of water added and fat abstracted.

Farmers.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
				Heard same day								
16	Milk	4 0 0 *7 W*	10 0 0 *4½ W*	20 0 0 *10 W*	Dismissed *9½ W*	Dismissed *8 W*	...	...	...	...	...	15 0 0 (Strangeways)
		Heard same day			*Heard same day*							
17	Do.	5 0 0 *12 W*	Costs only *26 W*	Dismissed *4½ W*	Dismissed *6½ W*	3 0 0 *10½ W*	3 0 0 *11½ W*	...	...	...	...	...
18	Do.	10 0 0 *33 F*	2 cases 20 0 0 *28 F* *28 F*	...	...	...	...	...	...	...	...	...
19	Do.	15 0 0 (In 2 cases) *20 F* *20 F*	15 0 0 (In 3 cases) *4½ W* *5 W* *8 W*	...	...	...	...	...	...	...	Hanley, Staffs.	40 0 0 (In 4 cases)
20	Do.	2 cases Dismissed *4 W & 8 W*	Dismissed *10 W*	...	...	...	...	...	...	...	...	2 0 0 Gorton *8 W*
21	Do.	2 0 0 (In 3 cases) *6 W* *4 W* *10 W*	4 0 0 (In 2 cases) *8 F* *13 F*	...	...	...	...	...	...	...	...	...
22	Do.	5 0 0 *7½ W*	2 0 0 (In 2 cases) *28 F* *10 F*	...	...	...	...	...	...	...	...	...
23	Do.	10 0 0 (In 2 cases) *10 W* *4½ W*	1 0 0 (In 4 cases) *16 F* *45 F* *30 F* *31 F*	...	...	...	...	...	...	...	...	...
24	Do.	2 0 0 *8 W*	10 0 0 *10 W*	5 0 0 (Refusing)	...	...	..	...	...	...	...	...
25	Do.	2 0 0 *4½ W*	2 0 0 (In 2 cases) *9½ W* *6 W*	...	...	...	...	...	...	...	...	...
26	Do.	4 0 0 (In 2 cases) *28 F* *33 F*	10 0 0 (In 2 cases) *10 F* *10 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

FARMERS—*continued.*

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In Count
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s.
27	Milk	15 0 0 *30 W*	20 0 0 *39 W*	10 0 0 (Refusing)	10 0 0 (Refusing)	10 0 0 *14 W*	5 0 0 (Refusing)	20 0 0 *14 W*	20 0 0 *12 W*	10 0 0 *15 W*	10 0 0 *8 W*	20 0 (Strang ways
28	Do	2 0 0 *12 F*	5 0 0 *4½ W* *15 F*	...	...	...	...	...	...	...	...	...
29	Do.	2 0 0 (In 2 cases) *20 W* *29 W*	2 0 0 *23 W*	...	...	...	...	...	...	...	...	...
30	Do	4 0 0 (In 2 cases) *7 W* *10 W*	5 0 0 (In 2 cases) *8 W* *8 W*	...	...	...	...	...	...	...	...	...
31	Do	5 0 0 *20 F*	5 0 0 *13 W*	...	...	...	...	...	...	...	...	...
32	Do.	1 0 0 *10 F*	5 0 0 *20 F*	10 0 0 *6 W*	2 cases 5 0 0 *10 W* *6 W*	5 0 0 *12 F*	2 0 0 *6 W*	...	...	...	...	...
33	Do.	3 0 0 *13½ W*	5 0 0 *8 W*	...	...	...	...	...	...	...	...	...
34	Do.	15 0 0 (In 3 cases) *7 W* *12 W* *11 W*	10 0 0 *20 W*	...	...	...	...	...	...	...	...	...
35	Do.	2 0 0 *10 F*	5 0 0 *11 W*	5 0 0 *11 W*	3 cases 20 0 0 *11 W* *15 W* *15 W*	...	...	...	...	...	Altr'ncham Salford Do.	Dis- misse 2 0 2 0
		Heard same day										
36	Do.	15 0 0 *17 W*	5 0 0 *17 W*	...	...	...	...	...	...	...	Salford L'pool Do.	10 0 10 0 10 0
37	Do.	10 0 0 (In 2 cases) *44 F* *25 F*	5 0 0 *8½ W &* *7 F*	...	...	...	...	...	...	...	...	...
38	Do.	2 cases 5 0 0 5 0 0 *7 W* *10 W*	2 cases 10 0 0 10 0 0 *16 W* *13 W*	...	...	...	...	...	...	...	...	...
39	Do.	2 cases 1 0 0 1 0 0 *17 F* *20 F*	10 0 0 *7 W*	...	...	...	...	...	...	...	...	...
40	Do.	2 cases 2 0 0 2 0 0 *7 W* *3 W*	2 0 0 *6 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

Butter Cases.

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
41	Costs only July 19th, 1878 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	Withdrawn Jan. 11th, 1893 (Excess Water) *10 per cent.*	Withdrawn Jan. 11th, 1893 (Excess Water) *8⅓ per cent.*
42	2 0 0 Jan. 13th, 1886 (Butterine)	1 0 0 Dec. 7th, 1887 (Butterine)	....	....
43	2 0 0 April 16th, 1884 (Butterine)	2 0 0 Jan. 15th, 1886 (Butterine)	Costs only Jan. 10th, 1894 (Packet not marked Margarine)	....
44	2 0 0 April 16th, 1884 (Butterine)	3 0 0 Dec. 22nd, 1886 (Butterine)	3 0 0 March 5th, 1890 (Margarine)	3 0 0 March 5th, 1890 (Margarine)
45	2 0 0 May 21st, 1884 (Butterine)	5 0 0 Jan. 13th, 1886 (Butterine)	5 0 0 Dec. 7th, 1887 (Butterine)	....
46	0 10 0 Dec. 7th, 1887 (Butterine)	Dismissed March 14th, 1894 (Excess Water) *6 per cent.*	Dismissed March 14th, 1894 (Excess Water) *5⅓ per cent.*	....
47	2 0 0 March 31st, 1886 (Butterine)	1 1 0 May 2nd, 1888 (Margarine)	....	....
48	Dismissed April 8th, 1885 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	....	....
49	Do.	Do.	....	....
50	2 0 0 April 16th, 1884 (Butterine)	10 0 0 Nov. 13th, 1889 (Margarine)	....	....
51	1 1 0 Dec. 7th, 1887 (Butterine)	2 0 0 April 17th, 1889 (Margarine)	....	....
52	5 0 0 March 21st, 1888 (Margarine)	Withdrawn Jan. 11th, 1893 (Excess water) *9 per cent.*	....	....
53	0 5 0 March 13th, 1889 (Margarine)	Dismissed Jan. 23rd, 1894 (Excess Water) *11½ per cent.*	....	....
54	0 5 0 Oct. 3rd, 1888 (Margarine)	Dismissed March 14th, 1894 (Excess Water) *7 per cent.*	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

BUTTER CASES—*continued*

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	
55	1 0 0 Nov. 23rd, 1892 (Margarine)	2 0 0 Oct. 20th, 1897 (Margarine)	5 0 0 March 8th, 1899 (Foreign Fat) *80 per cent.*	....
56	1 0 0 Nov. 21st, 1894 (Margarine)	10 0 0 July 26th, 1899 (Margarine)	....	....
57	2 0 0 April 1st, 1896 (Margarine)	3 0 0 Dec. 1st, 1897 (Margarine)	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

CANAL BOATS ACTS.

The number of canal boats on the register is 479.

The number of inspections made was 1,750, resulting in three infringements of the Act being discovered, which were referred to the Justices to be dealt with; in one case a fine was imposed amounting to £0 2s. 6d., with costs £0 12s. 6d.

Two cases were withdrawn.

Seventy caution notices were sent to the owners and masters.

OFFENSIVE TRADES.

The number of offensive trades on the register is 681. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 570 houses were certified to be dealt with by the Sanitary Committee.

Of these, 494 were ordered to be closed.

In the majority of these the owners arranged to make alterations to meet the requirements of the Corporation.

PARTICULARS RELATING TO THE OPERATIONS OF THE CLEANSING DEPARTMENT.

Cleansing Department,
Town Hall, Manchester,
June 21st, 1904.

Dear Sir,—There are within the City: pail-closets, 69,090; ash-boxes, 69,799; midden-privies, 18,260; wet middens, 9,430; dry middens, 705; water-closets, 52,658; and cesspools, 83. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The midden-privies are emptied as required. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fæcal matter is dried into concentrated manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the machinery. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Vale. The privy refuse and fæcal matter, which is taken to Water Street, is sent away in its crude state as nightsoil to Carrington and Chat Moss Estates and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fæcal matter from the pail-closets.

The market garbage, of which we have 5,822 tons per annum, is carted to Water street, and destroyed in the furnaces. Slaughter-house refuse is collected from the abattoirs and private slaughter-houses and sent to Holt Town, where it is passed through dryers, and the dry material is then added to the concentrated manure. Street sweepings are generally deposited at the nearest depot, and after being allowed to drain are carted to the nearest tip, or to the Water Street Depot, from whence they are sent away by boat to farmers or the Committee's Estates.

The total quantity of material collected by this Department during the past year amounted to 367,336 tons, including 46,330 tons deposited at the Clayton Vale tip for the formation of an embankment for the Electricity Committee Railway.

We have within the City about 34 destructor furnaces of different kinds, and last year 13,883 tons of mortar was made from the clinker obtained from such furnaces.

We employ about 49 "orderly" youths and men, who collect horse-droppings and litter from the streets, and deposit the same in the bins fixed in the footpaths. The contents of the bins are removed twice daily, and taken to the nearest depôt.

Acting upon instructions received from you, special pails and lids are supplied for all cases of Enteric Fever; labels are attached to the pails, asking the occupants to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not placed in the ashplace. The occupants of the houses are requested to use this special pail for the reception of the fæcal matter and washings from the patient only. The pails are removed in a specially-constructed vehicle, and taken to Holt Town Depot, where the contents are destroyed.

With regard to the cleansing of passages, we have a staff of about 34 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 341,898 swillings and cleansings were effected in courts and passages.

During the year, 73,475 barrels of water were used in degging the streets, and 278,857 grids were unstopped.

During the past 13 years, we have deposited upon the various tips within the City the following quantities of material, viz.:—In 1892, 99,866 tons; 1893, 109,078 tons; 1894, 103,949 tons; 1895, 113,836 tons; 1896, 107,883 tons; 1897, 99,658 tons; 1898, 96,635 tons; 1899, 104,481 tons; 1900, 95,138 tons; 1901, 64,781 tons; 1902, 117,619 tons; 1903, 180,985 tons; and in 1904, 141,999 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During last year 19,192 tons of material was sent to Carrington Estate and 58,871 to Chat Moss Estate.

Yours faithfully,

R. Williamson,

Superintendent.

Dr. Niven,
Medical Officer of Health,
Town Hall, Manchester.

DEPARTMENT OF MEAT INSPECTION.

City Abattoirs,
Manchester,
January 31st, 1903.

Dr. Niven,
Medical Officer of Health,
Town Hall.

Dear Sir,—I have pleasure in submitting the following report with reference to work done, and the amount of unwholesome food seized and destroyed under the Public Health Acts, 1875 and 1890, during the year ending December 31st, 1903 :—

Abattoirs and Carcase Market.

The number of animals slaughtered in the Abattoirs, Water Street, during 12 months :—

Cattle	Sheep	Lambs	Calves	Pigs
31,269	117,045	50,741	1,175	14,357

The number of carcases exposed for sale in the Dead Meat Market, Water Street :—

		Beast	Sheep	Lambs	Calves	Pigs
Abattoir killed ...		28,328	109,042	47,614	138	1,796
Imported	Fresh ...	36,493	40,978	189	16,095	19,592
	Chilled & Frozen	14,794	205,643	61,237	603	20,172
Total		79,615	355,663	109,040	16,836	41,560

Offals.

Beast, Sheep, and Pig Offals :—

Imported and exposed in the Meat Market { Fresh ... . . 1,405,600lbs. / Chilled and Frozen 1,178,100lbs.

Rusholme Abattoirs.

The number of animals slaughtered at the Abattoirs, Monmouth Street, Rusholme :—

Beast	Sheep and Lambs	Calves	Pigs
639	6,293	276	3,233

Private Slaughter-houses.

The amount of slaughtering executed in the private slaughter-houses is approximately estimated in the following figures :—

	Cattle	Sheep and Lambs	Pigs
Beef Butchers	9,672	40,092	—
Pork „	—	—	21,840

Unsound Food.

The amount of unwholesome food condemned during the year is summarised in the subjoined tables :—

Meat and Fish.

Beef	133,292 lbs.
Mutton	11,370 ,,
Veal	4,785 ,,
Pork	27,848 ,,
(Imported Offals)	32,756 ,,
Venison	46 ,,
Total	210,097 lbs.

Fish	219,438 lbs.
Shellfish	48,034 ,,
Total	267,472 lbs.

Fruit.

Strawberries	222 tubs
	50 peck
	14 trays
	16 baskets
Bananas	102 crates
	11 cases
Plums	79 baskets
	1 barrel
	1 sieve
Cherries	part box
Dates	38 boxes
Apples	6½ barrels
Tomatoes	4 cases
Gooseberries	3 baskets
Grapes	2 barrels
Blackberries	1 barrel
	1 basket

Game and Rabbits.

Quails	300 head
Rooks	158 ,,
Partridge	129 brace
Ptarmigan	50 ,,
Guinea Fowl	33 ,,
Black Game	21½ ,,
Snipe	8 head
Woodcock	1 ,,
Hares	281 ,,
Rabbits	5,166 ,,

Poultry.

Chickens	943 head
	1 case
Ducks	518 head
Turkeys	476 ,,
Geese	53 ,,

Vegetables.

Beans	101 baskets
	12 pots
Onions	82 cases
Carrots	61 bags
Mushrooms	31 baskets
Cauliflowers	32 sacks
	7 hampers
Sprouts	12 sacks
Radishes	11 barrels
Parsley	8 pots
Leeks	8 pots
Cress	2 hampers

Miscellaneous.

Cocoa Nuts	9 bags
Chesnuts	1 basket
Yeast	4 bags
Eggs	3 cases

Number of Seizures and reasons therefor.

The number of carcases, portions of carcases, and consignments of fish, etc., condemned during the year has been 2,155, and from the following causes :—

Decomposing	1,452	Joint Disease	3
Tuberculosis	288	Septicæmia	3
Unmarketable	91	Measles	3
Emaciation	53	Pleurisy	2
Smothered	39	Asphyxia	3
Flukes	38	Pericarditis	2
Inflammation	35	Diarrhœa	2
Injured	31	Actinomycosis	2
Fevered	26	Parasitic	1
Dropsy	23	Œdema	1
Abscesses	7	Necrosis	1
Anthrax	6	Drowned	1
Peritonitis	6	Worried	1
Congestion	6	Poisoned	1
Choked	4	Blood Poison	1
Black quarter	4	Fatty Degeneration	1
Parturient Fever	4	Malignant Tumours	1
Swine Fever	4	Hydatids	1
Milk Fever	3	Unseasonable	1
White Scour	3	Rheumatism	1

The following table will show where the meat and fish were condemned, and the amounts taken from each place :—

In the Abattoirs and Carcase Market (of which 112,375 lbs. was dressed meat consigned from other places than the City.)		175,108	lbs.
,,	Pig Market	8,603	,,
,,	Private Slaughter-houses	3,608	,,
,,	Triperies	2,785	,,
,,	Shops	2,114	,,
,,	Rusholme Abattoirs	220	,,
,,	Farms	352	,,
,,	Warehouses	258	,,
,,	Cold Air Stores	17,188	,,
,,	Campfield Market	70	,,
,,	Crumpsall Workhouse	56	,,
,,	Prestwich Workhouse	30	,,
,,	Hawkers' Carts	112	,,
,,	Railway Stations	43,018	,,
,,	Fish Markets	224,009	,,
,,	Smithfield Market	38	,,

The game, rabbits, poultry, fruit, vegetables, and miscellaneous :—

At Fish Market.

Quails	300	head
Partridge	82½	brace
Ptarmigan	50	,,
Guinea Fowl	33	,,
Black Game	21½	,,
Rooks	158	head
Turkeys	457	,,
Chickens	929	,,
	1	case
Ducks	510	head
Geese	19	,,
Snipe	8	,,
Hares	218	,,
Rabbits	4,522	,,

At Smithfield Market.

Rabbits	595	head
Geese	22	,,
Chickens	12	,,
Wood Cock	1	,,
Bananas	102	crates
	2	cases
Plums	79	baskets
	1	barrel
	1	sieve
Strawberries	50	peck
Dates	38	boxes
Apples	6	barrels
Tomatoes	4	cases
Grapes	2	barrels
Blackberries	1	barrel
	1	basket
Beans	101	baskets
	12	pots
Mushrooms	23	baskets
Radishes	11	,,
Parsley	8	pots
Leeks	8	,,
Cauliflowers	7	hampers
Cress	2	,,
Cocoa Nuts	9	bags
Chesnuts	1	bag

At Railway Stations.

Strawberries	222	tubs
	16	baskets
	14	trays
Gooseberries	3	baskets
Onions	82	cases
Cauliflowers	32	sacks
Sprouts	12	sacks
Mushrooms	8	baskets
Yeast	4	bags
Eggs	3	cases

At Cold Air Stores.

Partridge	46½	brace
Rabbits	45	head
Turkeys	16	,,
Geese	12	,,
Ducks	8	,,
Carrots	61	bags

At Shops.

Rabbit	4	head
Chickens	2	,,
Apples	½	barrel

On Hawkers' Carts.

Bananas	9	cases
Plums	1	barrel
Cherries	part	box

At Poultry Dressers' Cellars.

Turkeys	3	head

With the exception of 1,295 lbs. of meat, 578 lbs. ot fish, 4 rabbits, 3 turkeys, and 2 chickens, the whole of the above amounts have been surrendered* by the trade after being condemned by the Inspector.

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* The term surrender includes cases in which the Inspector has discovered the diseased meat in the course of his duty.

The Distribution of Inspection.

Abattoirs and Carcase Market.

These establishments are under constant supervision the whole day through. The inspection includes the examination of the animals slaughtered on the premises, also of the imported meat, which is very considerable—comprising Birkenhead and Danish carcases—of the chilled and frozen meat, and of dressed carcases from the country districts of Cumberland, Lancashire, Cheshire, and Yorkshire.

With regard to the inspection of imported meat, the most critical part is the examination of dressed carcases from the country districts, inasmuch as the majority of these carcases are of animals, especially cows, which have been slaughtered on account of being diseased, and it is sometimes extremely difficult to arrive at the true nature of the case when the Inspector has only got the bare carcase to look at, all the internal organs having been destroyed.

Much care however is exercised, and a microscopic examination of the blood frequently resorted to.

Fish Markets and Smithfield Fruit Market.

These markets are visited two and three times a day, and in the summer months an Inspector is in constant attendance. Saturday nights, also, an Inspector is on duty until the Market closes.

Private Slaughter-houses.

The number of private slaughter-houses on the register is 82. Five are at present unoccupied, and nine others only occasionally used. One slaughter-house has undergone structural alteration required by Committee.

There have been 2,429 visits made to the private slaughter-houses (83 being at the request of the butchers) and 10,849 carcases examined in them. Of these, 48 whole carcases and portions of 16 others were condemned as unfit for human food. Comprising 6 beast carcases, 41 pig carcases, and one sheep carcase, and portions of 13 beast carcases and 3 pigs

During the summer months, 80 visits were made to private slaughter-houses in the evenings between the hours of 7 p.m. and 10 p.m.

Shops.

There have been 5,305 visits made to the meat, fish, fruit, and provision shops in the poorer districts of the City; of these, 180 were made on Sunday mornings. Special attention has been given to the frozen meat shops, and to the bacon and small provision shops, and whenever any suspicious tins of meat, fish, or fruit are discovered, they are purchased by the Inspectors for further examination (analytically or otherwise).

Eighty-seven shopkeepers have been cautioned for having small amounts of unsound food in their possession. Twenty-seven being on Sunday morning.

Fifteen orders for the destruction of unsound food have been obtained at the City Police Court.

Triperies.

These places are regularly inspected, which has induced the tripe dressers to notify the Inspectors when they receive consignments of bellies of a doubtful nature. Fourteen bellies have been condemned on account of tuberculosis.

Railway Stations.

Three hundred and twenty-three visits have been made to the railway stations; these visits are made for two reasons:—

(1) To comply with the requirements of the Animals Transit and General Order, 1895.

(2) To ascertain what consignments of meat, beast offals, barrels of salted meat, etc., are arriving in the City, many of which are consigned direct to butchers' shops and warehouses, and do not come to the Abattoirs for inspection.

Sausage and Pie Factories.

A number of visits have been paid to these places, but nothing of an objectionable nature was detected.

Pig Market.

This market is inspected each day, including Sunday, and when sickly or injured pigs are discovered they are ordered to be slaughtered.

Porters' Carts and Beef Sheets.

These items receive the attention of the Inspectors, and I regret to say many of these meat carriers are extremely negligent in not keeping their carts and sheets in a thoroughly clean condition.

Carting Meat Through the Streets Uncovered.

Since my Committee drew the attention of the trade to this very unsightly practice much improvement has been made.

The police, who have a bye-law dealing with this matter, have cautioned not only the butchers, but also the railway companies' lurrymen and other carriers.

Legal Proceedings.

Legal proceedings have been instigated under the Public Health Act, 1875, against two butchers and two provision dealers for having in their possession and exposing for sale unsound beef and bacon. In each case a fine was imposed, amounting in all to £44 and costs.

The Granting of Certificates.

Official certificates are granted (upon request) to all salesmen by the Inspectors for the unwholesome food they condemn.

These certificates are chiefly sought for by the commission agents for the purpose of being forwarded to their senders as a guarantee of what has been condemned.

Thirteen hundred and eighty-eight such certificates have been issued during the past twelve months.

Disposal of Unsound Meat, Fish, and Slaughter-house Garbage.

This work is carried out by the Cleansing Department. At Holt Town Depot there is a tank provided for the boiling down of meat, and the fish is dried down in the cylinders. A great part of the diseased meat is burnt in furnaces at the Water Street Depot. The slaughter-house garbage is also disposed of with nightsoil refuse.

Notes on Diseases.

The number of seizures and surrenders made during the year have been previously stated to be 2,155, and the causes also enumerated. I may, however, make a few remarks on one or two of these conditions.

Decomposition.

With regard to this condition I may say that the numbers under its heading are chiefly comprised of fish, shellfish, game, poultry, rabbits, beef and pork offals, both English and foreign, and also of fruit and vegetables.

Anthrax.

Six cases of this most dangerous disease have been discovered at the City Abattoirs during the year, all of them being carcases of cows consigned from the country districts of Cheshire and Lancashire.

Anthrax appears to be greatly on the increase among cattle, especially in Cheshire. Farmers are doing little towards its suppression, and the carelessness manifested by them in sending such carcases to the market is inexplicable.

Tuberculosis.

This very troublesome disease continues to have a most marked effect upon the trade, more especially with regard to cows.

Much conflict of opinion still exists as to its dangerous effect upon the meat, and in some places serious friction has been caused between the authorities and the trade, more especially with regard to the line of demarcation between total and partial seizures.

In Manchester the recommendations of the Local Government Board are closely followed, and it will be seen that we deal with a great many animals of which only partial seizure ensues.

The cattle slaughtered at the Abattoirs are principally heifers and bullocks of the Irish, Welsh, and Norfolk varieties, only a small proportion of cows are killed, and the majority of these are from Ireland and Wales. Among such a class of animals tuberculosis cannot be supposed to be very prevalent—that is to say, to such an extent as to lead to the destruction of all or part of their carcases.

There have, however, been 193 seizures of tuberculous animals slaughtered at the Abattoirs. Of this number, 57 carcases were totally condemned; of the remaining 136, partial seizure only ensued, amounting in the aggregate to 39,643 lbs.

Of the dressed meat consigned from the country districts, 78 carcases were found to be tuberculous; of these, 20 were totally condemned, and from the remaining 58 bodies partial seizure ensued, amounting in all to 13,400 lbs.; in addition, 16 pig carcases have been condemned, amounting to 1,622 lbs.

In private slaughter-houses, 13 animals were observed to be tuberculous; of these, five carcases were totally condemned, and of the remainder partial seizure only took place, amounting in all to 2,353 lbs.

Swine Fever.

Nine pig carcases have been condemned for this affection, resulting from three outbreaks of this disease within the City, and were slaughtered under the Swine Fever Order by the owners.

Parasites.

There are several varieties of parasites which affect the organs of animals, some of which are directly transmissible to man, while others are of no great importance.

Three cases of measly pork have been discovered, which gives rise to a common tapeworm in man. The flukeworm is also very common in the livers of sheep and cattle; but while this parasite is not directly transmissible to man, it renders these organs unmarketable.

Hydatid cysts, Filaria worm, and Psorosperms are also found commonly in the organs of animals, causing them to be condemned.

Inflammatory Diseases.

The carcases condemned under these ailments are imported either alive or dressed to the Abattoirs, chiefly from dairy farmers around Manchester, and from the dairying districts in the counties of Cheshire, Lancashire, and Yorkshire, and, by reasons of emergency, the live animals are floated to these premises at very irregular hours. It is much preferable, however, that farmers should be allowed to send their animals here for slaughter when taken suddenly ill than to dispose of them in a concealed manner so as to escape inspection. Extreme care is taken over the examination of all animals and carcases showing any signs whatever of having been affected with any form of inflammation, as I regard all inflammatory affections as having a most serious effect upon meat for human consumption.

I am,

Your obedient Servant,

ALFRED HOLBURN, M.R.C.V.S.,

Chief Inspector.

CONTAGIOUS DISEASES OF ANIMALS.

Glanders.

During the year there has been one outbreak of glanders, one horse was found affected with the disease, and was immediately slaughtered by order of the Local Authority.

The value of the horse was estimated at £16, and the owner compensated in accordance.

Swine Fever.

Three outbreaks of swine fever have occurred, and have been dealt with by the Board of Agriculture.

Legal proceedings were taken against the owner of the swine in one case for failing to notify the existence of disease on his premises, as required by the Swine Fever Order, 1894, and a fine of £5 and costs was imposed.

Anthrax.

Six cases of anthrax have been discovered at the City Abattoirs. All of them, however, were carcases of cows consigned to the Abattoirs from country districts. Each case was reported to the Board of Agriculture and to the Local Authority from which it came, and have been dealt with by them. The carcases were cremated in our destructor, and all contaminated places cleansed and disinfected.

Parasite Mange.

Under the Manchester Parasitic Mange Order of 1903, 14 outbreaks of mange amongst horses have been dealt with. With two exceptions, good results have been obtained, and it may be calculated that when the Order becomes more generally known the Local Authority will receive more reports, and thus assist horse owners to suppress a very prevalent and serious disease.

Inspection.

The Pig Market, Water Street, is visited daily by a Veterinary Officer under the Swine Fever Order, 1894, and all cases of infringement are reported to the Board, or dealt with by the Inspectors.

Railway Stations.

Four hundred and eighty visits have been made to the railway stations and cattle docks for the purposes of the Animals Transit and General Order of 1895, more particularly with regard to the cleansing and disinfection of trucks, pens, and horse boxes.

Horse Market.

At each monthly horse market a Veterinary Inspector is in attendance, as required by the Glanders and Farcy Order, 1894.

There have been no cases of glanders detected in this market during the year.

ALFRED HOLBURN, M.R.C.V.S.,

Chief Veterinary Inspector.

TABLES.

TABLE A.—MANCHESTER, 1903.

CAUSES OF DEATH AT DIFFERENT LIFE PERIODS IN THE 52 WEEKS OF THE Y

PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	Ages at Death												
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85
		0 to 1	1 to 5										
All Causes	10782	2961	1577	275	147	188	274	634	874	1080	1223	1011	47
A.—General Diseases	4,230	1300	846	160	81	91	141	323	393	385	289	169	4
B.—Local Diseases	5,181	994	609	91	57	83	119	272	420	634	861	718	29
C.—Other Specified Dis:	14	6	2	...	...	...	1	1	1	...	1	1	
D.—Ill-defined Diseases	958	581	63	...	...	2	...	3	12	17	33	95	12
E.—Violent Deaths	399	80	57	24	9	12	13	35	48	44	39	28	
A.—General Diseases.													
Smallpox.. Vaccinated	17	1	...	...	...	...	...	...	7	5	3	...	
Smallpox.. Not Vaccinated	7	2	...	1	1	...	...	1	...	1	...	1	...
Smallpox.. No Statement	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox	...	...	...	...	...	...	...	...	...	...	...	...	...
Chickenpox	1	...	...	1	...	...	...	...	...	...	...	...	...
Measles	345	89	246	10	...	...	...	...	...	...	...	...	...
Epidemic Rose Rash	1	...	1	...	...	...	...	...	...	...	...	...	...
Scarlet Fever	97	2	63	21	5	3	1	1	1	...	...	...	...
Typhus	...	...	...	...	...	...	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	62	3	3	4	2	3	2	5	12	11	6	5	
Whooping Cough	213	98	112	3	...	...	...	...	...	...	...	...	...
Mumps	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria and Memb: Croup	136	6	85	36	5	2	...	1	...	1	...	...	...
Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple Cont: Fever	1	...	...	...	...	...	...	...	...	1	...	...	...
Enteric Fever	93	1	1	6	10	7	19	28	8	9	3	1	...
Asiatic Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...
Epidemic Diarrhœa	125	99	23	...	...	...	...	...	...	...	1	1	
Diarrhœa	379	289	68	2	...	...	...	...	2	3	2	7	
Dysentery	3	1	...	...	...	...	...	...	...	...	1	1	...
Malarial Fever	1	1	...	...	...	...	...	...	...	...	...	...	...
Hydrophobia	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders	...	...	...	...	...	...	...	...	...	...	...	...	...
Anthrax	...	...	...	...	...	...	...	...	...	...	...	...	...
Tetanus	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilis	36	33	1	...	...	...	...	...	...	1	1	...	...
Gonorrhœa, Strict: Urethra	14	...	...	...	...	...	...	...	5	4	4	1	...
Puerperal.. Septicæmia	9	...	...	...	...	1	2	5	1	...	...	...	...
Puerperal.. Pyæmia	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal.. Phlegmasia Dol:	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal.. *Fever*	5	...	...	...	...	...	3	2	...	...	...	...	...
Infective Endocarditis	1	...	...	...	...	1	...	...	...	...	...	...	...
Epidemic Pneumonia / Pneumonic Fever	1	...	1	...	...	...	...	...	...	...	...	...	...
Erysipelas	18	2	...	1	...	...	1	4	2	3	2	1	2
Septicæmia (not puerp:)	7	2	...	...	2	...	...	2	...	...	...	1	...
Pyæmia (not puerp:)	5	3	...	...	1	...	...	...	1	...	...	...	...
Phlegmon	...	...	...	...	...	...	...	...	...	...	...	...	...
Phagedœna	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Septic Diseases	6	1	2	1	...	...	..	...	2	...	...	...	...
Tubercular Phthisis	639	3	16	13	13	37	43	133	168	117	69	24	3
Phthisis	386	...	3	1	15	20	46	95	88	75	31	9	3

TABLE A, 1903—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
A.—General Diseases— *continued*														
bercular Meningitis	171	42	89	24	5	5	3	1	1	1	...	...	...	...
bercular Peritonitis	29	11	8	1	3	...	1	1	3	1	...	...	...	...
bes Mesenterica	71	50	16	5	...	...	...	...	...	...	...	...	...	...
pus	2	...	...	...	...	...	...	1	1	...	...	...	...	...
bercle of other organs	46	10	16	6	5	1	1	3	...	2	2	...	...	...
neral Tuberculosis	103	30	27	14	5	6	4	5	6	3	2	1	...	...
rofula	...	...	...	...	...	...	...	...	...	...	...	...	...	...
rasitic Diseases	1	1	...	...	...	...	...	...	...	...	...	...	...	...
arvation	1	...	...	...	...	...	...	...	...	...	...	...	1	...
urvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
coholism, Delirium Tremens	57	...	...	...	...	1	...	6	11	19	13	6	1	...
pium, Morphia Habit	...	...	...	...	...	...	...	...	...	...	...	...	...	...
omaine Poisoning	...	...	...	...	...	...	...	...	...	...	...	...	...	...
dustrial Poisoning — Lead	2	...	...	...	...	...	...	...	2	...	...	...	...	...
dustrial Poisoning — Phosphorus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
dustrial Poisoning — Arsenic, &c.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
heum: Fever, Acute Rheum:	26	...	...	3	6	1	4	5	5	1	1	...	...	...
heumatism of Heart	...	...	...	...	...	...	...	...	...	...	...	...	...	...
hronic Rheumatism	39	...	...	4	2	...	2	3	2	5	3	14	3	1
heum: Arthritis, Rheum: Gout	3	...	...	...	...	...	...	...	...	...	...	2	1	...
out	...	...	...	...	...	...	...	...	...	...	...	...	...	...
arcinoma	237	...	...	...	...	...	1	4	30	60	82	46	13	1
arcoma	41	...	...	1	...	1	4	4	9	12	6	4	..	...
Cancer," Malignant Disease	146	...	...	...	...	...	...	5	16	38	44	35	6	2
ickets	39	7	31	1	...	...	...	...	...	...	...	...	...	...
urpura	2	1	...	...	...	...	...	1	...	...	...	...	...	...
æmophilia, Hæm: Diathesis	1	1	...	...	...	...	...	...	...	...	...	...	...	...
næmia, Leucocythæmia	38	6	3	...	...	...	2	4	8	7	5	3	...	...
iabetes Mellitus	27	...	...	...	1	1	2	2	1	5	8	6	1	...
remature Birth	367	367	...	...	...	...	...	...	...	...	...	...	...	...
ongenital Defects	67	61	2	1	...	1	...	1	1	...	...	...	...	...
njury at Birth	5	5	...	...	...	...	...	...	...	...	...	...	...	...
telectasis	23	23	...	...	...	...	...	...	...	...	...	...	...	...
Vant of Breast Milk	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Teething	75	46	29	...	...	...	...	...	...	...	...	...	...	...
B.—Local Diseases.														
1.—Nervous System.														
nflammation of Brain	158	48	52	11	9	4	4	10	9	4	7	...	...	...
Softening of Brain	14	...	...	...	...	...	...	...	...	2	4	7	1	...
General Paraly: of Insane	37	...	...	...	1	...	...	3	13	11	3	6	...	...
nsanity (not puerperal)	134	...	...	...	...	1	2	6	20	18	33	35	19	...
Chorea	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Epilepsy	39	...	3	...	1	4	7	4	7	5	6	2	...	...
Convulsions	198	161	36	1	...	...	...	...	...	...	...	...	...	...
Laryngismus Stridulus	11	6	5	...	...	...	...	...	...	...	...	...	...	...
Locomotor Ataxy	8	...	...	...	...	...	...	...	2	3	3	...	...	...
Dis: of Spinal Cord	29	...	1	...	1	...	3	3	2	7	4	6	2	...
Neuritis	15	...	...	...	...	...	...	1	3	4	5	2	...	...
Brain Tumour	22	...	1	1	...	3	3	4	5	3	2	...	...	...
Nervous System (other Dis:)	29	1	...	2	...	...	...	2	3	6	8	5	2	...
2. Diseases of Special Sense Organs.														
Otitis, Mastoid Disease	11	1	6	1	1	...	1	...	...	1	...	...	...	...
Epistaxis, Nose Disease	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Ophthalmia, Eye Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1903—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	
		0 to 1	1 to 5											
3. Diseases of Heart.														
Valvular Dis: Endocarditis	210	2	1	4	11	18	13	19	28	35	44	29	6	
Pericarditis	10	3	1	1	...	...	...	...	3	...	1	1	...	
Hypertrophy of Heart.....	2	...	...	...	...	...	...	...	...	...	2	...	...	
Angina Pectoris	10	...	...	...	...	...	...	...	2	2	3	3	...	
Dilatation of Heart	68	2	...	...	...	...	...	1	4	15	20	19	7	
Fatty Degen: of Heart	20	...	...	...	...	...	...	1	1	5	3	7	3	
Syncope, Heart Disease.....	570	23	3	4	8	10	11	29	53	84	135	137	63	
4. Dis: of Blood Vessels.														
Cerebral Hæmorrhage.....	243	...	1	2	...	1	4	6	20	44	82	57	25	
Apoplexy, Hemiplegia.....	159	...	1	1	...	1	2	3	13	29	40	46	20	
Aneurism	22	...	...	...	...	...	...	3	3	9	6	1	...	
Senile Gangrene	7	...	...	...	...	...	...	...	...	1	2	2	2	
Embolism, Thrombosis	11	...	...	...	...	...	...	8	1	1	...	...	...	
Phlebitis.....	1	...	...	...	...	...	...	...	...	...	1	...	...	
Varicose Veins	1	...	...	...	...	...	...	...	1	...	...	...	...	
Blood Vessels (Other Diseases)	29	...	...	...	...	...	...	...	2	5	9	7	6	
5. Dis: of Respiratory Sys:														
Laryngitis	15	1	12	1	...	...	1	...	...	...	...	...	...	
Memb: Laryng: (Not Diphth:)	...	...	...	...	...	...	...	...	...	...	...	...	...	
Croup	9	2	7	...	...	...	...	...	...	...	...	...	...	
Larynx (Other Dis:)	2	...	...	...	...	...	...	...	...	...	1	...	...	
Bronchitis	1,034	278	119	4	2	2	4	15	39	90	194	183	94	
Pneumonia { Lobar.....	123	6	9	4	1	5	10	17	24	21	13	12	1	
Pneumonia { Broncho.....	427	171	179	11	2	...	1	8	8	20	16	8	3	
"*Pneumonia*".....	484	73	98	18	4	15	23	41	55	58	46	42	10	
Emphysema, Asthma	26	...	...	...	...	...	...	...	...	10	11	5	...	
Pleurisy	37	1	1	2	1	1	1	3	3	9	13	2	...	
Fibroid Disease of Lung.....	4	...	...	...	...	...	...	...	1	2	...	1	...	
Respiratory Dis: (Other)	31	6	2	1	1	1	1	2	1	5	3	6	1	
6. Dis: of Digestive Sys:														
Tonsillitis, Quinsy	9	2	3	2	...	...	...	1	...	1	...	...	...	
Mouth, Pharynx	23	15	5	1	...	1	...	...	...	1	...	...	...	
Gastric Ulcer.....	12	...	...	...	...	...	3	3	1	5	...	...	...	
Gastric Catarrh.....	30	21	2	...	...	...	...	...	...	1	2	3	1	
Stomach (Other Dis:).....	79	46	10	...	...	...	1	1	5	3	10	3	...	
Enteritis.....	46	23	7	1	1	1	2	1	1	2	1	3	3	
Gastro-Enteritis.....	45	30	9	...	...	...	1	1	...	...	1	1	2	
Appendicitis, Perityph:	20	...	...	3	4	4	2	1	3	2	...	1	...	
Hernia	30	6	...	...	...	...	...	3	2	3	8	7	1	
Intestinal Obstruct:.....	33	1	3	...	1	1	2	5	5	5	5	4	1	
Other Diseases of Intestines ...	16	5	4	...	1	...	...	...	3	2	...	1	...	
Peritonitis	42	4	5	4	...	3	4	7	5	4	4	2	...	
Cirrhosis of Liver.....	81	1	...	...	...	...	...	5	15	29	20	9	2	
Liver and Gall Bladder (O.D.).	43	19	...	...	...	...	...	3	2	4	5	7	3	
Digestive System (Other Dis:)...	38	16	6	...	...	...	...	1	2	3	3	7	...	
7. Dis: of Lymphatic and Ductless Glands.														
Spleen, Disease of.....	5	1	1	...	...	...	...	1	1	1	...	...	...	
Lymphat: Syst: (Other Dis:)...	10	...	1	1	...	1	...	2	...	2	3	...	...	
Thyroid Body (Other Dis:) ...	4	...	...	...	1	...	...	1	...	...	...	2	...	
Supra Renal Caps: (Dis: of)...	4	...	...	...	...	...	...	...	...	2	1	1	...	
8. Diseases of Urinary System.														
Nephritis Ac:, Uræmia	48	3	9	5	1	1	3	4	4	4	12	2	...	
Ch: Bright's Dis: Albumin: ...	155	1	1	...	1	3	3	19	26	37	47	14	3	
Calculus	1	...	...	...	...	...	...	...	1	...	...	...	...	
Bladder and Prostate Dis: ...	30	...	...	...	...	...	...	1	...	2	8	7	10	
Urinary Syst: (Other Dis:) ...	19	...	...	1	1	...	...	...	1	4	4	8	...	

TABLE A, 1903—*concluded.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
9. DISEASES OF GENERATIVE SYSTEM.														
Ovarian Tumour	3	...	...	...	...	...	...	...	...	2	1	...	...	...
Other Dis : of Ovary	3	...	...	...	...	...	...	...	1	1	1	...	...	...
Uterine Tumour	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Dis: of Uterus and Vagina	4	...	...	...	...	...	...	4	...	...	...	...	...	...
Disord : of Menstruation	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Gener: and Mam: Orgs: (other)	6	...	...	...	...	...	1	4	1	...	...	...	...	...
10. DISEASES OF PREGNANCY AND CHILDBIRTH.														
Abortion, Miscarriage	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Mania	3	...	...	...	...	...	...	2	1	...	...	...	...	...
Puerperal Convulsions	3	...	...	...	...	...	2	1	...	...	...	...	...	...
Placenta Præv: Flooding	9	...	...	...	...	1	2	3	3	...	...	...	...	...
Other Ac: of Preg: & Childbirth	13	...	...	...	...	...	1	7	5	...	...	...	...	...
11. DISEASES OF LOCOMOTOR SYSTEM.														
Caries, Necrosis	16	...	2	2	2	1	1	1	4	1	2	...	...	...
Arthritis, Periostitis	2	...	...	...	1	...	...	...	...	...	...	1	...	...
Locomotor Sys : (Other)	5	1	1	1	...	...	...	1	...	...	...	1	...	...
12. DISEASES OF THE SKIN.														
Ulcer, Bedsore	3	...	...	...	...	...	...	...	...	...	...	2	...	1
Eczema	6	4	...	...	...	...	...	...	...	...	2	...	...	...
Pemphigus	10	7	1	...	...	...	...	...	...	1	1	...	...	...
Skin Diseases (other)	9	3	1	...	...	...	...	...	1	2	...	1	1	...
C.—Other Specified Diseases	14	6	2	...	...	...	1	1	1	...	1	1	1	...
D.—Ill-defined and not Specified Diseases.														
Atrophy, Debility	620	537	43	...	...	...	...	...	...	2	5	13	18	2
Old Age	213	...	...	...	...	...	...	...	...	2	17	70	100	24
Dropsy, Ascites, Anasarca	1	..	...	...	...	...	...	...	...	...	...	1	...	...
Tumour	4	...	...	...	...	...	...	...	1	1	1	1	...	...
Abscess	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Hæmorrhage	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sudden (cause unascertained)	82	28	16	...	...	2	...	3	10	8	5	5	5	...
Other Ill-defined	37	16	4	...	...	...	...	...	1	4	5	4	2	1
E.—Violent Deaths.														
1. ACCIDENT.														
In Mines and Quarries	2	...	...	...	...	...	...	1	1	...	...	...	...	...
By Vehicles { On Railways	8	...	...	...	1	2	...	2	3	...	...	...	...	...
By Vehicles { In Streets	22	...	4	2	...	1	1	1	1	6	2	2	2	...
Ships, Boats, Docks (not Drowning)	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Building Operations	2	...	...	...	...	...	...	1	...	1	...	...	...	...
Machinery	10	...	...	...	...	...	1	1	6	2	...	...	...	...
Weapons and Implements	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burns and Scalds	60	2	36	12	3	...	...	1	1	2	2	1	...	...
Poison, Poisonous Vapours	15	...	2	...	...	2	5	3	2	1	...	...	...	...
Drowning	25	...	2	4	...	2	2	2	2	7	2	2	...	...
Suffocation	84	75	5	2	...	...	...	...	1	1	...	...	...	...
Falls	78	1	7	1	1	...	2	10	11	10	12	15	7	1
Weather Agencies	2	...	...	...	1	...	...	...	...	...	1	...	...	...
Otherwise or not Stated	23	1	...	3	3	3	1	1	4	2	3	2	...	...
2. HOMICIDE.	7	1	1	...	...	...	...	1	3	1	...	...	...	...
3. SUICIDE.	60	...	...	..	...	2	1	11	12	11	17	6	...	...
4. EXECUTION.	1	...	...	...	...	...	...	...	1	...	...	...	...	...

TABLE B.—MANCHESTER, 1903.

Causes of Deaths at Different Life Periods—MALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years: Under 5 Years 0 to 1	Under 5 Years 1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	5636	1609	787	139	75	88	144	358	490	617	643	467	198	21
A	Smallpox	18	2	...	1	1	...	...	1	3	6	2	1	1	...
	Measles	168	50	114	4	...	...	...	...	...	...	...	...	...	...
	Scarlet Fever	48	...	34	8	2	3	...	...	1	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	99	50	48	1	...	...	...	...	...	...	...	...	...	...
	Diphtheria, Memb: Croup	68	4	45	16	1	...	...	1	...	1	...	...	...	...
	Ill-defined Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Enteric Fever	63	1	1	3	9	5	12	23	4	4	1	...	...	...
	Influenza	34	3	1	2	...	2	1	3	8	7	1	4	2	...
	Epidemic Diarrhœa	67	53	12	...	...	...	...	...	...	...	1	...	1	...
	Diarrhœa, Dysen., Simple Chol.	195	148	36	1	...	...	...	...	2	2	2	3	1	...
	Venereal Affections	35	19	...	...	...	...	...	...	5	5	5	1	...	...
	Erysipelas	6	1	...	...	...	...	1	2	...	...	1	...	1	...
	Pyæmia, Septicæmia	12	4	...	...	3	...	...	1	3	...	...	1	...	.
	Puerperal Fever ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	2	1	1	...	...	...	...	...	...	...	...	...	...	...
	Tuberc. Periton: Tabes Mes:	59	36	15	2	1	...	1	1	3	...	...	...	...	...
	Tubercular Meningitis	89	24	42	16	2	3	1	1	...	...	...	...	...	...
	Phthisis	643	2	15	9	8	24	51	132	168	135	77	19	3	...
	Tuberculous Dis. (other)	77	21	22	7	6	3	4	3	5	3	2	1	...	...
	Parasitic Diseases	...	...	...	...	..	...	...	...	...	...	...	...	...	...
	Alcoholism	39	...	...	...	...	1	...	4	5	15	9	5	...	...
	Rheumatic Fever	15	...	...	2	6	1	2	1	2	1	...	...	...	...
	Cancer	185	...	...	1	...	...	3	7	22	49	68	32	3	...
	Premature Birth	196	196	...	...	...	...	...	...	...	...	...	...	...	...
	Congenital Defects	34	30	1	...	...	1	...	1	1	...	...	...	...	...
	Epilepsy	15	...	1	...	...	1	1	3	4	1	2	2	...	...
	Convulsions	116	97	19	...	...	...	...	...	...	...	...	...	...	...
	Nervous Syst: (other)	232	31	32	6	5	4	7	13	30	35	35	26	8	...
	Cereb: Haem: Apoplexy, Hemip:	171	...	1	1	...	1	2	6	14	35	52	40	18	1
	Heart and Blood Vessel Dis:	443	12	3	3	8	12	13	23	45	75	107	95	42	5
B and C	Croup	4	2	2	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	485	150	44	1	...	1	1	11	11	45	89	88	43	1
	Pneumonia	605	145	144	23	5	11	21	48	54	66	48	32	8	...
	Respiratory Dis: (other)	71	3	10	2	1	2	2	2	4	21	14	9	...	1
	Digestive Syst: (other)	285	113	26	6	6	2	3	16	21	34	35	18	5	...
	Urinary Syst: (other)	146	3	5	4	...	1	3	16	14	27	37	22	12	2
	Generative Organs	1	...	...	...	...	...	1	...	...	...	...	...	...	...
	Other specified Diseases	187	59	51	7	5	2	3	8	14	11	12	11	4	...
D	Marasmus and Atrophy	339	294	25	...	...	...	..	...	...	1	2	7	8	2
	Old Age	75	...	...	...	...	...	...	...	...	...	7	30	31	7
	Other Ill-defined Causes	69	22	10	...	...	...	...	2	10	9	7	5	3	1
E	Violence	188	32	26	13	6	7	10	17	28	22	12	10	4	1
	Homicide	4	1	1	...	...	...	...	1	1	...	...	...	...	...
	Suicide	48	...	...	...	...	1	1	11	8	7	15	5	...	...

TABLE C.—MANCHESTER, 1903.

Causes of Deaths at Different Life Periods—FEMALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years: Under 5 Years: 0 to 1	Under 5 Years: 1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	5146	1352	790	136	72	100	130	276	384	463	580	544	275	44
A	Smallpox	6	1	...	...	...	...	...	...	4	...	1	...	...	...
	Measles	177	39	132	6	...	...	...	...	...	...	...	...	...	...
	Scarlet Fever	49	2	29	13	3	...	1	1	...	...	...	...	...	...
	Typhus Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough	114	48	64	2	...	...	...	...	...	...	...	...	...	...
	Diphtheria, Memb: Croup	68	2	40	20	4	2	...	...	...	...	...	...	...	...
	Ill-defined Fever	1	...	...	...	..	...	...	..	...	1	...	...	...	..
	Enteric Fever	30	...	...	3	1	2	7	5	4	5	2	1	...	...
	Influenza	28	...	2	2	2	1	1	2	4	4	5	1	3	1
	Epidemic Diarrhœa	58	46	11	...	...	...	...	...	...	...	...	1	...	...
	Diarrhœa, Dysentery, Simple Cholera	187	142	32	1	...	...	...	...	...	1	1	5	4	1
	Venereal Affections	15	14	1	...	...	...	...	...	...	...	...	...	...	...
	Erysipelas	12	1	...	1	...	...	...	2	2	3	1	1	1	...
	Pyæmia, Septicæmia	6	2	2	1	...	...	...	1	...	...	...	...	...	...
	Puerperal Fever	14	...	...	...	...	1	5	7	1	...	...	...	...	...
	Other Zymotics	3	...	1	1	...	1	...	...	...	...	...	...	...	...
	Tubercular Periton : Tabes Mes.	41	25	9	4	2	...	...	...	...	1	...	...	...	...
	Tubercular Meningitis	82	18	47	8	3	2	2	...	1	1	...	...	...	...
	Phthisis	382	1	4	5	20	33	38	96	88	57	23	14	3	...
	Tuberculous Diseases (other)	74	19	21	13	4	4	1	6	2	2	2	...	...	...
	Parasitic Diseases	1	1	...	...	...	...	...	...	...	...	...	...	...	...
	Alcoholism	18	...	...	...	...	...	...	2	6	4	4	1	1	...
	Rheumatic Fever	11	...	...	1	...	...	2	4	3	...	1	...	...	...
	Cancer	239	...	...	...	...	1	2	6	33	61	64	53	16	3
	Premature Birth	171	171	...	...	...	...	...	...	...	...	...	...	...	...
	Congenital defects	56	54	1	1	...	...	...	...	...	...	...	...	...	...
	Epilepsy	24	...	2	...	1	3	6	1	3	4	4	...	...	...
	Convulsions	82	64	17	1	...	...	...	...	...	...	...	...	...	...
	Nervous System (other)	226	24	27	9	6	4	5	16	27	23	34	35	16	...
B and C	Cerebral Hemorrhage, Apoplexy, and Hemiplegia	231	...	1	2	...	1	4	3	19	38	70	63	27	3
	Heart and Blood Vessel Diseases	518	18	2	6	11	16	11	38	53	82	119	111	45	6
	Croup	5	...	5	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	549	128	75	3	2	1	3	4	28	45	105	95	51	9
	Pneumonia	429	105	142	10	2	9	13	18	33	33	27	30	6	1
	Respiratory Diseases (other)	44	5	5	2	1	...	1	3	1	5	14	5	1	1
	Digestive System (other)	262	76	28	5	1	8	12	16	23	31	24	30	8	...
	Urinary System (other)	107	1	5	2	3	3	3	8	18	20	34	9	1	...
	Generative Organs and Childbirth	44	...	...	...	...	1	5	21	11	4	2	...	...	...
	Other specified Diseases	148	33	27	3	3	1	6	9	7	16	14	23	4	2
D	Marasmus and Atrophy	281	243	18	...	...	...	...	...	...	1	3	6	10	...
	Old Age	138	...	...	...	...	...	...	...	...	2	10	40	69	17
	Other Ill-defined Causes	56	22	10	...	...	2	...	1	2	4	4	7	4	...
E	Violence	144	47	30	11	3	3	2	6	5	10	10	12	5	...
	Homicide	3	...	...	...	...	...	...	...	2	1	...	...	...	...
	Suicide	12	...	...	...	...	1	...	...	4	4	2	1	...	...

TABLE D.

City of Manchester, 1903.—Causes of Death in Infancy and Childhood.

Causes of Death	Under One Year			Total under One Year	One and under Five Years				Total under Five Years
	Under 3 months	3–6 months	6–12 months		1–	2–	3–	4–	
All Causes	1,404	639	918	2,961	916	308	215	138	4,538
Measles	2	9	78	89	137	59	36	14	335
Scarlatina	...	...	2	2	8	19	19	17	65
Whooping Cough	17	17	64	98	64	29	11	8	210
Diphtheria (Memb: Croup)	...	1	5	6	31	22	18	14	91
Fever (various forms)	...	...	1	1	...	...	1	...	2
Diarrhœal Diseases	104	130	155	389	78	9	3	1	480
Syphilis	20	11	2	33	1	...	...	...	34
Tabes Mesenterica and Tuberc. Peritonitis	18	16	27	61	17	2	5	...	85
Hydrocephalus	7	10	25	42	47	15	13	14	131
Scrofula (other)	11	9	23	43	25	13	13	11	105
Premature Birth	357	6	4	367	...	...	...	...	367
Teething	...	3	43	46	26	3	...	...	75
Convulsions	99	32	30	161	27	7	2	...	197
Brain Diseases (other)	11	13	31	55	37	12	6	7	117
Lung Diseases	130	140	268	538	286	65	58	18	965
Atrophy, Marasmus	344	125	68	537	36	5	...	2	580
Found Dead in Bed	54	20	9	83	3	...	1	...	*87
Suffocation	2	2	...	4	1	...	...	1	6
Violence (other forms)	1	3	1	5	16	16	12	8	57
Ill-defined Causes	13	4	15	32	12	4	1	2	51
Unclassified	214	88	67	369	64	28	16	21	498

* 74 of these were "Found dead in bed, suffocated."

TABLE E, 1881 TO 1903.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS *(a)* from all causes, and *(b)* from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions; also the quinquennial averages from 1871–1900, with the average for same period.

	Years	Estimated Populations (Mean)	Persons Married	Annual Rates per 1,000 Persons living: Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Percentages to Total Deaths: Inquest Cases	Deaths in Public Institutions	Years	
Quinquennial Averages	1871–1875	477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03	0·94	7·2	13·4	1871–1875	Quinquennial Averages
	1876–1880	509,802	18·6	38·7	26·2	0·24	0·53	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04	0·89	7·5	14·3	1876–1880	
	1881–1885	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03	0·72	7·0	15·9	1881–1885	
	1886–1890	575,630	16·6	33·4	24·6	0·02	0·83	0·50	0·32	0·54	0·02	0·30	0·01	1·06	0·02	0·78	6·9	17·7	1886–1890	
	1891–1895	517,801	16·9	33·2	23·6	0·03	0·62	0·26	0·27	0·64	0·00	0·24	0·01	1·14	0·05	0·77	7·1	19·2	1891–1895	
	1896–1900	539,599	18·2	32·5	22·7	...	0·89	0·20	0·13	0·53	0·00	0·18	0·01	1·65	0·04	0·73	7·1	20·2	1896–1900	
Avge. 30 yrs.	1871–1900	527,154	18·8	35·3	24·8	0·10	0·70	0·60	0·17	0·67	0·05	0·27	0·06	1·32	0·03	0·80	7·1	16·8	1871–1900 Avge. 30 yrs.	
	1881	530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02	0·84	8·1	15·9	1881	
	1882	536,324	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·00	0·03	0·67	7·2	14·5	1882	

TABLE E—*Continued.*

Years	Estimated Populations (Mean)	Persons Married	Annual Rates per 1,000 Persons living: Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Percentages to Total Deaths: Inquest Cases	Deaths in Public Institutions	Years
1883	542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03	0·73	7·0	15·5	1883
1884*	549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05	0·65	6·2	17·3	1884*
1885	555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02	0·69	6·4	16·4	1885
1886	562,166	16·4	34·7	24·1	0·00	0·27	0·41	0·15	0·57	0·03	0·29	0·01	1·34	0·04	0·71	7·2	17·0	1886
1887	568,819	16·6	33·9	25·4	0·01	1·54	0·63	0·23	0·50	0·02	0·31	0·01	1·19	0·02	0·77	6·9	16·1	1887
1888	575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01	0·74	6·7	18·3	1888
1889	582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03	0·89	6·5	18·2	1889
1890*	589,253	17·0	31·8	26·2	...	0·83	0·60	0·36	0·37	0·01	0·27	0·02	1·04	0·02	0·79	7·0	19·1	1890*
1891†	‡ 508,673	17·2	33·8	26·0	...	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04	0·79	6·8	18·4	1891†
1892†	‡ 513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02	0·77	7·4	18·2	1892†
1893†	‡ 517,760	16·0	33·4	24·3	0·09	0·57	0·27	0·35	0·46	0·00	0·25	0·01	1·75	0·10	0·76	6·9	18·7	1893†
1894†	‡ 522,365	16·8	31·8	19·8	0·04	0·42	0·22	0·29	0·55	...	0·17	0·01	0·70	0·02	0·75	7·5	21·3	1894†
1895†	‡ 527,010	17·4	33·4	24·5	0·00	0·96	0·33	0·21	0·47	...	0·18	0·01	1·66	0·06	0·80	6·9	19·2	1895†
1896†*	‡ 531,697	18·3	32·8	22·0	...	1·05	0·37	0·15	0·66	0·00	0·22	0·01	1·04	0·02	0·71	7·4	19·7	1896†*
1897†	‡ 536,426	17·8	32·9	22·4	...	1·17	0·23	0·08	0·56	0·00	0·18	0·00	1·74	0·06	0·68	6·6	20·0	1897†
1898†	‡ 541,296	18·3	32·3	21·2	...	0·50	0·12	0·09	0·31	...	0·22	0·01	1·96	0·06	0·69	7·0	19·5	1898†
1899†	‡ 546,010	18·4	32·2	23·9	...	1·28	0·08	0·16	0·42	0·00	0·13	0·01	2·02	0·03	0·78	7·0	19·7	1899†
1900†	‡ 542,566	18·0	32·4	23·8	...	0·47	0·19	0·19	0·68	...	0·14	0·01	1·49	0·03	0·78	7·4	21·9	1900†
1901†	‡ 546,408	17·6	28·7	21·6	...	0·53	0·23	0·24	0·41	0·02	0·14	0·00	1·86		0·78	7·9	23·2	1901†
1902†*	‡ 550,355	18·1	33·0	20·0	...	0·44	0·27	0·22	0·44	...	0·12	...	0·54		0·73	7·6	23·8	1902†
1903†	‡ 554·331	17·8	31·7	19·5	0·04	0·62	0·17	0·25	0·38	...	0·17	0·00	0·91		0·72	7·0	25·3	1903†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates

TABLE F, 1881 TO 1903.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

YEAR	ANNUAL RATES PER 1,000 PERSONS LIVING										RATES PER 1,000 BIRTHS	
	Cancer	Tabes Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennia: 1881–1885	0·50	0·35	2·42	0·57	3·28	1·37	5·41	1·23	0·48	0·08	3·03	1·99
1886–1890	0·64	0·36	2·24	0·59	3·09	1·73	5·76	1·23	0·61	0·08	3·22	2·13
1891–1895	0·62	0·22	2·09	0·75	1·74	2·53	5·56	1·07	0·52	0·07	2·75	3·42
1896–1900	0·73	0·19	2·04	0·63	1·32	2·54	5·03	1·04	0·49	0·09	1·55	1·51
20 years 1881–1900	0·62	0·28	2·20	0·64	2·36	2·04	5·44	1·14	0·43	0·08	2·64	2·26
1881	0·48	0·28	2·46	0·52	3·33	1·19	5·57	1·24	0·39	0·07	3·15	1·37
1882	0·44	0·40	2·41	0·61	3·35	1·34	5·33	1·19	0·45	0·08	3·92	1·62
1883	0·54	0·34	2·54	0·59	3·32	1·33	5·66	1·20	0·50	0·06	2·27	1·58
1884*	0·51	0·39	2·34	0·56	3·27	1·44	4·88	1·23	0·59	0·10	2·81	2·55
1885	0·51	0·36	2·34	0·56	3·12	1·53	5·59	1·28	0·49	0·08	3·05	2·84
1886	0·56	0·43	2·44	0·59	3·30	1·53	5·43	1·26	0·57	0·08	2·67	1·85
1887	0·62	0·39	2·19	0·53	3·17	1·66	5·72	1·23	0·53	0·08	3·58	1·35
1888	0·65	0·31	2·14	0·62	3·19	1·72	5·31	1·16	0·62	0·10	4·12	1·77
1889	0·70	0·36	2·12	0·59	2·94	1·79	5·06	1·28	0·64	0·08	3·06	1·87
1890*	0·65	0·33	2·33	0·62	2·87	1·93	7·28	1·22	0·66	0·08	2·68	3·89
1891†	0·63	0·25	2·20	0·78	2·30	2·69	6·77	1·03	0·55	0·07	3·08	4·01
1892†	0·61	0·21	2·05	0·75	1·70	2·59	5·44	1·14	0·53	0·05	3·79	4·54
1893†	0·59	0·26	2·05	0·76	1·70	2·48	5·53	1·20	0·53	0·07	3·70	3·94
1894†	0·66	0·18	1·97	0·67	1·48	2·31	4·35	0·96	0·49	0·04	1·93	2·77
1895†	0·63	0·22	2·16	0·77	1·51	2·60	5·73	1·04	0·49	0·11	1·25	1·82
*1896†	0·66	0·13	2·00	0·60	1·33	2·53	5·19	1·04	0·46	0·11	0·96	1·47
1897†	0·74	0·22	2·12	0·67	1·35	2·45	4·51	1·03	0·51	0·10	2·10	1·36
1898†	0·73	0·19	1·95	0·67	1·22	2·15	4·27	1·00	0·54	0·09	1·72	1·54
1899†	0·75	0·24	2·05	0·61	1·34	2·73	5·47	0·99	0·47	0·10	1·37	1·54
1900†	0·76	0·17	2·09	0·60	1·37	2·82	5·78	1·15	0·48	0·05	1·59	1·65
1901†	0·78	0·20	2·09	0·83	1·22	2·55	4·48	1·00	0·49	0·03	2·17	1·72
*1902†	0·79	0·16	2·08	0·55	1·13	2·61	4·71	0·93	0·58	0·11	0·94	1·65
1903†	0·76	0·18	1·85	0·58	1·25	2·46	3·95	0·99	0·46	0·08	0·80	1·59

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE G, 1903.—POPULATION, AREA, DENSITY. TOTAL BIRTHS AND DEATHS WITH BIRTH AND DEATH RATES.

[INSTITUTION POPULATIONS, BIRTHS AND DEATHS, DISTRIBUTED.]

STATISTICAL DIVISIONS	Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS	
				Total	Rate per 1,000	Total	Rate per 1,000
City of Manchester	**554,331**	**12,910**	**43**	**17,569**	**31·69**	**10,782**	**19·4**
I. Manchester Township..	132,160	1,646	80	4,411	33·38	3,339	25·2
II. North Manchester	172,289	7,321	24	5,464	31·71	2,618	15·2
III. South Manchester	249,882	3,943	63	7,694	30·79	4,825	19·3
I. Ancoats	44,437	400	111	1,625	36·57	1,139	25·6
I. Central	28,525	748	38	783	27·45	772	27·0
I. St. George's.....	59,198	498	119	2,003	33·84	1,428	24·1
II. Cheetham	38,778	919	42	1,286	33·16	483	12·4
II. Crumpsall	9,051	733	12	204	22·54	111	12·2
II. Blackley	9,174	1,840	5	248	27·03	146	15·9
II. Harpurhey	17,809	193	92	567	31·84	228	12·8
II. Moston	14,241	1,297	11	343	24·09	168	11·8
II. Newton Heath	37,143	1,350	28	1,152	31·02	626	16·8
II. Bradford	24,311	288	84	893	36·73	497	20·4
II. Beswick	11,987	96	125	474	39·54	202	16·8
II. Clayton	9,795	605	16	297	30·32	157	16·0
III. Ardwick	42,618	509	84	1,501	35·22	789	18·5
III. Openshaw	27,890	581	48	948	33·99	508	18·2
III. West Gorton ..:.....	30,315	318	95	900	29·69	519	17·1
III. Rusholme and Kirk. ...	25,533	1,412	18	715	28·00	382	14·9
III. Chorlton-upon-Medlock	57,398	646	89	1,382	24·08	1,115	19·4
III. Hulme.....	66,128	477	139	2,248	33·99	1,512	22·8

NOTE.—Calculated on the Census of 1891 and 1901.

TABLE H, 1903.

BIRTHS REGISTERED IN THE CITY OF MANCHESTER, IN ITS MAIN DIVISIONS AND IN DISTRICTS; DISTINGUISHING LEGITIMATE AND ILLEGITIMATE BIRTHS; ALSO THE PROPORTION OF MORTALITY AMONG INFANTS OF BOTH CLASSES UNDER ONE YEAR OF AGE.

STATISTICAL DIVISIONS		BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
		Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester		**17,569**	**722**	**4·1**	**2,961**	**218**	**169**	**163**	**302**
I.	Manchester Township	4,411	221	5·0	859	77	195	187	348
II.	North Manchester	5,464	140	2·6	767	38	140	137	271
III.	South Manchester	7,694	361	4·7	1,335	103	174	168	285
I.	Ancoats	1,625	54	3·3	316	17	194	190	315
	Central	783	70	8·9	162	22	207	196	314
	St. George's	2,003	97	4·8	381	38	190	180	392
II.	Cheetham	1,286	36	2·8	143	8	111	108	222
	Crumpsall	204	11	5·4	18	2	88	83	182
	Blackley	248	8	3·2	32	1	129	129	125
	Harpurhey	567	16	2·8	60	3	106	103	188
	Moston	343	7	2·0	47	3	137	131	429
	Newton Heath	1,152	23	2·0	185	9	161	156	391
	Bradford	893	19	2·1	164	6	184	181	316
	Beswick	474	13	2·7	62	2	131	130	154
	Clayton	297	7	2·4	56	4	189	179	571
III.	Ardwick	1,501	84	5·6	258	27	172	163	321
	Openshaw	948	23	2·4	176	4	186	186	174
	Gorton (West)	900	29	3·2	159	10	177	171	345
	Rusholme and Kirk.	715	33	4·6	85	5	119	117	152
	Chorlton-on-Medlock	1,382	98	7·1	253	27	183	176	276
	Hulme	2,248	94	4·2	404	30	180	174	319

TABLE J, 1903

Infantile Mortality in the City, and its Three Main Divisions.

Death-rates under One Year per 1,000 Births.

Causes of Death	City of Manchester	Manchester Township	North Manchester	South Manchest
All Causes	168·54	194·74	140·37	173·51
Measles	5·07	5·89	3·29	5·8
Whooping Cough	5·58	2·95	4·58	7·8
Other Com: Infectious Diseases†	0·68	0·91	0·73	0·5
Diarrhœal Diseases	22·14	31·29	15·01	21·97
Tubercular Diseases‡	8·31	9·75	3·66	10·79
Convulsions	9·16	9·29	8·60	9·49
Other Nervous Diseases§	3·13	2·72	3·84	2·86
Lung Diseases	30·62	33·10	26·72	31·9
Wasting Diseases ‖.....	51·45	60·76	45·20	50·56
Suffocation	0·23	0·45	.....	0·26
Found dead in bed	4·72	7·71	2·93	4·29

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fev including the chief forms of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and Ger Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

‖ These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debi Inanition, &c.

TABLE K, 1903.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL DIVISIONS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester	City of Manchester Average of 10 years 1893-1902
All Causes	19·45	25.26	15·20	19·31	22·35
Smallpox	0·04	0·11	0·03	0·02	0·01
Measles	0·62	0·96	0·34	0·64	0·74
Scarlet Fever	0·17	0·14	0·21	0·17	0·23
Typhus Fever	...	...	...	...	0·00
Influenza	0·11	0·08	0·15	0·10	0·23
Whooping Cough	0·38	0·25	0·24	0·55	0·50
Diphtheria, and Memb: Croup	0·25	0·16	0·26	0·28	0·20
Ill-defined Fever	0·00	...	0·01	...	0·01
Enteric Fever	0·17	0·16	0·15	0·18	0·18
Diarrhœal Diseases	0·91	1·41	0·64	0·84	1·50
Puerperal Fever	0·03	0·04	0·01	0·03	0·06
Erysipelas	0·03	0·05	0·03	0·03	0·10
Pyæmia, Septicæmia	0·03	0·06	0·04	0·01	0·03
Phthisis (Tuberc: Pulmon:)	1·85	3·00	1·05	1·79	2·06
Tubercular Meningitis	0·31	0·34	0·21	0·36	0·29
Tuberc: Periton: Tabes Mes:	0·18	0·19	0·06	0·26	0·20
Tuberculous Dis: (other)	0·27	0·42	0·14	0·28	0·39
Alcoholism	0·10	0·16	0·05	0·11	0·12
Cancer	0·76	0·84	0·66	0·80	0·71
Rheumatic Fever	0·05	0·05	0·06	0·04	0·07
Premature Birth	0·66	0·74	0·65	0·63	0·61
Nervous Diseases	1·25	1·34	1·10	1·32	1·37
Heart and Blood Vessels Diseases	2·46	3·13	1·89	2·50	2·52
Bronchitis	1·87	2·69	1·51	1·67	2·21
Pneumonia	1·87	2·62	1·38	1·80	2·46
Respiratory Diseases (other)	0·22	0·24	0·18	0·24	0·33
Digestive Organs (Diseases of)	0·99	1·11	0·98	0·92	1·03
Urinary Organs (Diseases of)	0·46	0·59	0·30	0·50	0·50
Old Age	0·38	0·36	0·33	0·44	0·43

TABLE L, 1903.

MANCHESTER.—Certification of the Causes of Death in the Main Divisions and in Districts.

STATISTICAL DIVISIONS.	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
					Certified by		
		Registered Medical Practitioners	Coroner		Regist'd Medical Practitioners	Coroner	Not Certified
City of Manchester	**10,782**	**9,877**	**753**	**152**	**91·6**	**7·0**	**1**
I. Manchester Township ...	3,339	2,977	298	64	89·2	8·9	1·
II. North Manchester	2,618	2,425	159	34	92·6	6·1	1·
III. South Manchester	4,825	4,475	296	54	92·8	6·1	1·
I. Ancoats	1,139	1,020	96	23	89·6	8·4	2·
I. Central	772	668	87	17	86·5	11·3	2·
I. St. George's	1,428	1,289	115	24	90·2	8·1	1·
II. Cheetham	483	449	24	10	92·9	5·0	2·
II. Crumpsall	111	100	8	3	90·1	7·2	2·
II. Blackley	146	137	8	1	93·8	5·5	0·
II. Harpurhey	228	218	8	2	95·6	3·5	0·
II. Moston	168	159	9	...	94·6	5·4	..
II. Newton Heath	626	577	42	7	92·2	6·7	1·
II. Bradford	497	456	36	5	91·8	7·2	1·
II. Beswick	202	184	15	3	91·1	7·4	1·
II. Clayton	157	145	9	3	92·4	5·7	1·
III. Ardwick	789	727	51	11	92·1	6·5	1·
III. Openshaw	508	476	30	2	93·7	5·9	0·
III. Gorton (West)	519	479	35	5	92·3	6·7	1·
III. Rusholme and Kirk. ...	382	361	19	2	94·5	5·0	0·
III. Chorlton-upon-Medlock	1,115	1,020	76	19	91·5	6·8	1·
III. Hulme	1,512	1,412	85	15	93·4	5·6	1·

TABLE M, 1903—CITY OF MANCHESTER.—ANNUAL RATES OF MORTALITY AT SIX GROUPS OF AGES, * PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years	5 to 15 Years	15 to 25 Years	25 to 45 Years	45 to 65 Years	Over 65 Years
All Causes	69·54	3·71	4·05	8·99	29·70	97·49
Smallpox	0·05	0 02	...	0·05	0·12	0·13
Measles	5·13	0·09	...	...	...	...
Scarlatina	1·00	0·23	0·04	0·01	...	...
Diphtheria, Memb. Croup	1·40	0·36	0·02	0·01	0.01	...
Whooping Cough	3·22	0·03	...	...	...	...
Fever — Typhus	...	...	...	...	...	...
Fever — Enteric	0·03	0·14	0·23	0·21	0·15	0·06
Fever — Continued	...	...	...	...	0·01	...
Diarrhœal Diseases	7·36	0·02	...	0·01	0·09	1 01
Tubercular Diseases	4·92	0·97	1·46	3·02	3·91	2·52
Malignant Disease	0·00	0·01	0·05	0·41	3·12	6·73
Diseases of ... Nervous System	4·81	0·25	0·27	0·58	1·78	5·48
Diseases of ... Heart and Blood Vessels	0·57	0·27	0·53	1·20	7·45	28·70
Diseases of ... Respiratory System	14·79	0·46	0·57	1·29	6·60	23·98
Diseases of ... Digestive System	3·72	0·16	0·22	0·45	1·60	3·84
Diseases of ... Urinary System	0·21	0·08	0·09	0·33	1·52	2·90
Other Diseases	22·34	0·64	0·58	1·42	3·33	22·15

* For death-rates at all ages, see Table K.

TABLE N, 1903.—ANNUAL RATES OF MORTALITY IN STATISTICAL DIVISIONS (SIX GROUPS OF AGES, * PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years			5 to 15 Years			15 to 25 Years		
	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South
All Causes	87·03	53·15	72·24	4·69	3·35	3·44	4·29	3·49	4·1
Smallpox	0·13	...	0·04	...	0·03	0·02	...	...	..
Measles	7·91	2·63	5·49	0·15	0·05	0·08	...	...	..
Scarlatina	0·90	1·08	0·99	0·19	0·24	0·24	...	0·08	0·(
Diphtheria, Memb. Croup	1·16	1·08	1·76	0·11	0·54	0·36	...	0·03	0·(
Whooping Cough	2·12	1·97	4·75	...	...	0·06	...	...	..
Fever — Typhus	...	...	...	...	...	...	..	...	...
Fever — Enteric	0·06	0·05	...	0·22	0·13	0·10	0·15	0·14	0·1
Fever — Continued	...	...	...	...	...	...	...	...	..
Diarrhœal Diseases	11·44	4·61	7·18	...	0·03	0·02	...	..	..
Tubercular Diseases	6·24	2·58	5·95	1·52	0·59	0·95	1·27	1·25	1·1
Diseases of — Nervous System	4·88	4·56	4·96	0·19	0·35	0·20	0·22	0·25	0·2
Diseases of — Heart & Blood Vess:	0·51	0·56	0·60	0·19	0·38	0·24	0·78	0·36	0·5
Diseases of — Respiratory System.	18·51	11·89	14·92	0·82	0·35	0·34	0·67	0·50	0·5
Diseases of — Digestive System	3·99	3·81	3 52	0·22	0·16	0·12	0·34	0·22	0·1
Diseases of — Urinary System	0·19	0·19	0·25	0·11	0·05	0·08	0·15	0·06	0·0
Other Diseases	28·99	18·14	21·85	0·97	0·46	0·62	0·71	0·61	0·6
Malignant Disease	0 00	0·00	0·00	0·04	0·00	0·00	0·07	0·03	0·0

CAUSES OF DEATH	25 to 45 Years			45 to 65 Years			Over 65 Years		
	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes	13·14	6·54	8·53	40 28	23·51	27 63	105·60	87·13	99·2
Smallpox	0·13	0·02	0·03	0·35	0·09	...	0·24	0·23	...
Measles	...	...	...	...	...	...	...	...	...
Scarlatina	...	0·02	0·01	...	...	...	...	...	...
Diphtheria, Memb. Croup	...	...	0·01	...	0·05	...	...	...	...
Whooping Cough	...	...	...	...	...	...	...	...	...
Fever — Typhus	...	...	...	...	...	...	...	...	...
Fever — Enteric	0·21	0·20	0·23	0·10	0·23	0·14	...	...	0·1
Fever — Continued	...	...	...	...	0·05	...	...	...	...
Diarrhœal Diseases	0·05	...	...	0·15	0·14	0·03	0·73	1·81	0·6
Tubercular Diseases	4·88	1·81	2·88	7·02	1·60	3·60	5·35	0·45	2·1
Diseases of — Nervous System	0·72	0·47	0·58	2·37	1 14	1·84	3·65	4·74	6·9
Diseases of — Heart & Blood Vess:	1·59	1·01	1·12	9·09	6·12	7·37	33·58	22·57	29·6
Diseases of — Respiratory System.	2·16	0·76	1·16	9·64	5·30	5·72	30·90	20·54	22·1
Diseases of — Digestive System	0·56	0·35	0·46	1·82	1·55	1·51	2·92	4·97	3·6
Diseases of — Urinary System	0·41	0·14	0·43	1·87	1·19	1·53	3·65	2·26	2·8
Other Diseases	2·34	1·76	1·61	7·88	6·07	5·89	24·57	29·57	30·8
Malignant Disease	0·56	0·33	0·37	3·38	3·20	2·93	4·62	5·64	8·5

* For death-rates at all ages, see Table K.

TABLE O, 1903.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

Disease	Hospital	In Hospital commencement of year	Admitted	Discharged	Died	Remaining in Hospital close of year
Smallpox	Clayton Hospital	15	418	400	25	8
	Total	15	418	400	25	8
Scarlet Fever	Monsall	351	1,672	1,741	82	200
	Other Hospitals	...	1	...	1	...
	Total	351	1,673	1,741	83	200
Diphtheria	Monsall	23	404	334	77	16
	Other Hospitals	...	...	...	...	...
	Total	23	404	334	77	16
Enteric Fever	Monsall	41	259	204	47	49
	Other Hospitals	...	24	14	6	4
	Total	41	283	218	53	53
Typhus Fever	Monsall	...	...	...	...	...
	Other Hospitals	...	...	...	...	...
	Total	...	...	...	...	...
Other Acute Diseases	Monsall	17	227	215	17	12
	Other Hospitals	1	38	39	...	...
	Total	18	265	254	17	12
All Diseases		448	3,043	2,949	255	289

PATIENTS SENT TO MONSALL, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1903.

Disease	Withington	Moss Side	Sale	Swinton Schools	Royal Infirmary	Cheadle Convalescent Home	Pendlebury Hospital	Chorlton Union Workhouse	Other Districts
Smallpox	...	...	...	...	...	...	...	3	3
Scarlatina	...	...	...	...	4	...	7	...	8
Diphtheria	...	1	...	1	3	...	4	...	1
Enteric Fever	1	...	...	...	...	...	...	...	...
Other Diseases	1	...	...	2	3	2	2	...	...

Total, 46.

TABLE P, 1903.—Work of Sanitary Department for the Year.

		TOWNSHIPS																		
		Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
Complaints to Sanitary Superintendent ...		2,185	2,141	2,881	1,907	550	268	594	571	1,584	2,227	596	6	1,938	1,356	402	1,852	2,641	4,606	28,305
Inspections of	Dwelling-houses	7,586	6,978	8,472	4,901	1,111	396	972	1,216	4,156	3,678	1,757	596	3,907	2,211	2,185	2,861	4,716	6,766	64,465
	Newly-infected Dwelling-houses	212	235	454	257	89	61	123	84	210	148	107	32	241	150	224	157	346	441	3,571
	Cellars.....	...	13	2	27	4	...	...	...	1	52	...	...	92	...	...	...	76	389	656
	Schools	5	...	16	1	7	3	...	1	1	5	3	...	2	3	6	2	9	7	71
	Factories and Workshops	66	46	93	1	...	13	...	1	11	7	10	...	...	13	7	...	20	59	347
	Lodging-houses	469	1.031	1,903	823	...	...	2	3	5	14	36	4	14	3	...	23	201	345	4,876
	Offensive Trades	16	22	34	13	20	12	7	2	28	13	...	17	45	8	72	10	1	25	345
	Dairies and Milkshops.....	259	477	137	288	65	68	63	48	86	326	41	193	277	51	49	182	161	149	2,920
	Bakehouses	283	576	218	587	11	20	90	8	125	82	22	14	165	76	174	173	607	580	3,811
	Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,811
	Slaughter-houses	1	...	...	...	...	...	...	...	...	...	...	...	8	...	12	10	...	2	33
	Tips for Refuse.....	...	...	...	...	...	5	40	40	5	7	1	17	2	83	...	...	...	...	200
	Miscellaneous Inspections	854	2,269	1,333	900	335	101	128	241	737	586	398	708	740	1,479	549	493	904	3,354	16,110
	Factories and Workshops by Shop Hours, &c., Inspectors.....	1,167	5,569	1,196	2,667	21	18	116	9	255	141	43	20	447	175	294	149	1,212	1,360	14,859
	Shops by Shop Hours, &c., Inspectors	258	1,528	128	600	1	5	8	...	58	41	8	...	102	158	111	150	172	391	3,719
Infected Rooms Fumigated.....		943	10	996	648	177	50	141	198	588	706	420	12	680	587	40	302	238	1,468	8,202
Infected Dwellings Re-inspected		698	238	1,089	593	180	145	278	149	419	344	471	331	371	139	336	420	866	911	7,978
Drains Tested by Water		365	378	459	419	135	20	63	56	383	250	192	...	140	277	207	425	287	215	4,261
Smoke Abatement	Observations made	51	88	23	45	21	7	4	13	83	86	3	32	26	53	21	13	21	42	632
	Proceedings before Magistrates	18	33	5	16	5	1	...	5	24	4	2	11	5	11	9	2	4	13	168
Food Adulteration	Samples Collected for Analysis	233	174	167	64	22	25	48	22	107	72	...	22	97	72	78	59	272	254	1,796*
	Proceedings before Magistrates	10	26	2	1	1	...	1	...	...	3	...	1	7	1	4	1	11	4	73
Ashpits reported to Cleansing Department for emptying		87	39	4	3	295	99	72	31	134	157	10	186	24	120	222	133	9	6	1,631
Receptacles reported to Cleansing Department for emptying.....		341	110	131	819	3	...	43	...	18	102	386	...	83	28	77	57	27	123	2,348
Notices issued for Abatement of Nuisances.		800	1,052	1,273	1,455	237	106	182	126	435	314	313	82	821	317	266	651	969	1,629	11,028
Letters written for Abatement of Nuisances		84	90	77	187	15	22	10	1	38	41	11	3	35	23	11	34	104	158	944
Reports made to Medical Officer of Health		1,999	2,229	3,052	1,899	720	259	586	560	1,485	2,065	598	957	2,565	1,317	2,141	2,270	2,946	4,084	31,732
Legal proceedings taken		10	10	33	9	...	1	3	...	2	16	5	...	4	4	...	17	10	8	133
Total Nuisances abated		752	751	1,370	1,248	307	118	232	109	420	280	372	105	1,022	362	209	615	1,011	1,391	10,674
Number of Cottages under Five Rooms																				

* Samples 1,480; Offensive Cattle 316.

INDEX.

	PAGE
Admissions to hospitals	295
Antitoxic serum treatment	237
Area of City and districts in acres	1, 288
Average number of persons in houses of 4 rooms and under	1
Bacteriological examination	119, 137, 176
Bakehouses	212–215
Births	1, 288
,, Illegitimate	289
Birth-rates	1, 288
Blood serum test in enteric fever	137
Butchers' meat, prices of	7
Certification of cause of death	292
Charts	104
Childhood, deaths at	284
Cleansing Department, work of	265–266
Closets, number of	265
Coal, prices of	7
Comparison of death-rates in districts	21
Compulsory notification	47
Consumption	170–187
Coroner's inquests	292
Corrected and recorded death-rates in Manchester compared with 76 towns	2–3
Corrected populations in age-groups, 1891–1903	13
Corrected death-rates in age-groups, 1891–1903	13
Deaths	1, 288
,, in public institutions	6
,, from infectious diseases for 11 years	47
,, in age-groups	16, 278–281
,, males	282
,, females	283
,, in infancy	284
,, in childhood	284
Deaths and tracheotomy	238
,, under 1 year of age per 1,000 births	1
Death-rates	1, 288
,, corrected and recorded for 76 towns	2–3
,, gains and losses	8–9
,, in age-groups, 1891–1903	13
,, in the homes of the people, in workhouses, and in hospitals	18
,, in districts	288
,, specified causes	293, 294
Density of population	1
Diarrhœa	160–170
,, effect of season	163
,, tables regarding	161–163
,, and flies	168
,, District Mortality	168
,, Propositions	169–170
Diphtheria and Membranous Croup.	104–119
,, seasonal incidence	104
,, and rainfall	105
,, bacteriological examination of cases in months	106–107
,, tables regarding	108–109
,, and school infection	111
,, Contacts	113, 118
,, Effect of removal to Hospital	116
,, bacteriology, analysis of work	119
District mortality	288
Enteric fever	120–137
,, tables regarding	120–123
,, and flies	123
,, and shell fish	124–129
,, and direct infection	130–136
,, and outside infections	137
,, and bacteriological examinations	137

INDEX—*continued.*

	PAGE
Estimated population	1, 288
,, increase of population	1
,, populations in age groups	16
Excess of births over deaths	1
Factory and Workshop Act, 1901 :— Administration of	206–212
Summary of work by Inspectors	207–210
Classification of Outworkers	211
Factory and Workshop Act, 1901 :— Bakehouses	212–225
Fever, scarlet	83–103
,, enteric	120–137
,, isolation of cases	295
,, bacteriological work	119–137
,, hospitals, admissions to	295
Flour, price of	7
Food, seizure of unwholesome	267–276
Gains and losses	8–9
Homes of the people, death-rates in	18
Hospitals, fever admissions	295
Hospitals, death-rate	18
House Drainage Department	249
Houses, inhabited and uninhabited	1
Housing of the working classes	215–227
Illegitimacy and mortality	289
Illegitimate births	289
Infantile deaths	284
Infantile mortality	290
Infectious diseases	47
Inhabited houses	1
Inquests, Coroner's	292
Insanitary dwellings	215–227
Institution death-rates	18
Isolation hospitals	295
Jewish Ladies' Society for Visiting the Poor	227–230
Ladies' Public Health Society	227–230
Manchester Union	7
Markets—seizure of unwholesome food	267–276
Married, persons	1
Marriage-rates	1, 285–286
Measles prevalence	138–158
,, and schools	138
,, tables regarding	138–140
,, special report regarding	141–158
Membranous croup—see diphtheria	104–119
Midwives Act, 1902	227
Milk and tuberculosis	187–206
Monsall Fever Hospital—Report of Medical Superintendent	230–248
Mortality in zymotic diseases	285–286
,, from certain causes	287
,, and illegitimacy	289
,, infantile	290
,, comparison in divisions	288
Notification of infectious diseases	47
Pail closets	265
Pauperism	7
Persons to an acre	1, 288
Phthisis	170–187
Physical progress of the community.	22–46
Population, estimates of	1, 288
,, natural increase of	1
,, density of	1, 288
Populations corrected in age-groups	13
Provisions, etc., prices of	7
Public institutions, deaths in	6
Recorded and corrected death-rates in 76 towns	2–3
Sanitary Department, work of	248–264
Scarlet fever	83–103
,, tables regarding	84–86
,, decrease of	87-89
,, and rainfall	89–91
,, direct transmission	91
,, micro-organisms	92
,, hospital influence	96
,, return cases of	93–99
,, removal of cases	94
,, progression of in districts	95–96
,, overlooked cases	97
,, and schools	103
,, sources of infection	103

INDEX—*continued.*

	PAGE
Schools and diphtheria	111
,, measles, etc.	138
,, consumption	182–184
Seizure of unwholesome food	267–276
Shell fish and enteric fever	124–129
Smallpox	48–83
,, administrative work	48–55
,, overlooked cases	55–61
,, and influence of common lodging-houses	61–62
,, and tramps	62
,, and influence of houses	62
,, and places of work	62
,, vaccination and schools	62–64
,, treatment of cases in hospital	64–67
,, vaccination	66–79
,, second attacks of	79
,, evidence of disease from vaccination	79–80
,, complications	80
,, fatal cases, particulars of	82
,, staff	83
Statistics, Vital	1–22
,, general, with special reference to the physical progress of the community	22–46
Summer diarrhœa	160–170
,, effect of season	163
,, tables regarding	161–163
,, and flies	168
,, district mortality	169
,, propositions	169–170
Tenements, number of	1
,, 4 rooms and under	1
Tuberculosis and milk	187–206
Tuberculosis and Manchester cow-sheds	188
,, and Manchester cows	191
,, and milk clauses	192
,, and tuberculous milks	192
,, and disposal of cows having tuberculous udders	198–206
Tuberculosis and bacteriological work	176
Typhoid fever—see enteric fever	120–137
Uncertified deaths	292
Unhealthy dwellings	215–227
Uninhabited houses	1
Unwholesome food	267–276
Voluntary notification of phthisis	170–187
Notifications	171–173
Deaths	172–173
Administrative action	174–187
Supervision of cases	174
Cleansing and disinfection	175
Deaths amongst notification	176
History of infection	177
Occupations	181
and schools	182–184
Personal habits	186
Predisposing illnesses	186
Vital statistics	1–22
Whooping cough, prevalence	159–160
,, tables regarding	159–160
Work of Sanitary Department.	248–264
Workhouse death-rate	18
Working classes, housing of	215–227
Zymotic diseases	47